



A Comparative Analysis of German and Australian Climate Change Coverage in Quality Newspapers

Framing a political election and an environmental disaster

Lena Birkenfeld



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NEU - Nachhaltigkeits-, Energie- und Umweltkommunikation

Herausgegeben von

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Das Themenfeld Nachhaltigkeit, Energie und Umwelt stellt Gesellschaften weltweit vor Herausforderungen. Wie sich Umweltprobleme erfolgreich angehen lassen, wie Energiegewinnung und -nutzung bestmöglich realisiert und auf welche Weise diese Prozesse nachhaltig gestaltet werden können, wird von Akteuren aus Politik, Wirtschaft, Wissenschaft sowie Zivilgesellschaft kontrovers diskutiert. Welche Interessen sich dabei durchsetzen und wie Entscheidungen ausfallen, hängt wesentlich davon ab, wie diese Themen öffentlich kommuniziert werden. Daher ist die Erforschung dieser Kommunikationsprozesse – ihrer Entstehungsbedingungen, ihrer Ausgestaltung und ihrer Wirkung – von großer Bedeutung.

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Abbreviations and acronyms

AER	Australian Energy Regulator
AGEB	AG Energiebilanzen e. V.
AUD	Australian Dollar
BASF	Badische Anilin- und Soda-Fabrik
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
BHP	Broken Hill Proprietary Company
BMUB	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit
BP	British Petroleum
CCS	Carbon Capture and Storage
CDU	Christlich Demokratische Union Deutschlands
CEO	Corporate Europe Observatory
CEPOS	Center for Politiske Studier, Danish group
CFACT	Committee for a Constructive Tomorrow
CFC	Chlorofluorocarbons
Corp.	Corporation
COP	Conference of the Parties
CSU	Christlich-Soziale Union in Bayern e. V.
cm	centimetre
DWD	Deutscher Wetterdienst
E.ON	E.ON SE
EEG	Erneuerbare-Energien-Gesetz [Renewable Energy Source Act]
et al.	Latin for “et alii”, and others

etc.	Latin for “et cetera”, and the rest
EU	European Union
EU-ETS	European Union Emissions Trading System
e. V.	German for “Eingetragener Verein” [Registered association]
f.	and the following (page, paragraph etc.)
ff.	and the following (pages, paragraphs etc.)
FAZ	Frankfurter Allgemeine Zeitung
FDP	Freie Demokratische Partei
G8	Group of Eight
GDF	Gaz de France
GfdS	Gesellschaft für deutsche Sprache e. V.
GWPF	Global Warming Policy Foundation
i. e.	Latin for “id est”, that means
IEA	Institute of Economic Affai
IPCC	Intergovernment Panel of Climate Change
IPN	International Policy Network
IUCN	International Union for Conservation of Nature and Natural Resources
l/m ²	litres per square metre
LUGV	Landesamt für Umwelt, Gesundheit und Verbraucherschutz
MCII	Munich Climate Insurance Initiative
NGO	Non-Governmental Organisation
NSW	New South Wales
ORF	Onshore Receiving Facility
p.	page

pp.	pages
PDS	Partei des Demokratischen Sozialismus
SMH	The Sydney Morning Herald
SPD	Sozialdemokratische Partei Deutschland
StrEG	Stromeinspeisungsgesetz [Act on supplying electricity from renewables]
SZ	Süddeutsche Zeitung
UK	United Kingdom
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
US	United States
WAZ	Westdeutsche Allgemeine Zeitung, media group
ZKI	Zentrum für Satellitengestützte Kriseninformation
°C	degree Celsius

1. Introduction

From 15 to 20 May 2010, the River Oder burst its bank – an incident which created one of Germany’s most serious floods ever (LUGV 2012, p. 11). The floods were a result of heavy rainfall of up to 300 l/m² (ZKI 2010). The water level rose to 653 cm in Eisenhüttenstadt, the second highest level since weather records began in the country (LUGV 2012, p. 11).

In the same year, starting in December 2010, La Niña Modoki weather pattern resulted in heavy rainfall in Eastern Australia. As a consequence, this month became Queensland's wettest in history, with high rainfall totals recorded in 107 locations (Bureau of Meteorology 2011). It was “one of the most significant floods in Queensland’s history” (Bureau of Meteorology 2011), accompanied by the state’s first cyclone of the season, severe thunderstorms with large hailstones in the southeast, 16 low daily and low mean maximum temperature records and seven high daily and mean minimum temperature records (Bureau of Meteorology 2011).

These two events are clearly extreme weather events. But were they considered to be a consequence of climate change in the media?

On 27 September 2009, the German political party CDU won an election and built a coalition with the FDP. In their coalition agreement, they stated that they intended to tackle climate change by promoting a low-carbon economy, they argued that renewable technologies presented an opportunity for the German economy and that they wanted to reduce global greenhouse gas emissions (Neuhoff 2010, p. 134). With these goals, the new government extended the coalition agreement drawn up by the former government, a coalition of CDU and SPD, which expressed the intention to reduce the costs for the economy related to the European Union Emissions Trading System (Koalitionsvertrag 2005, p. 55) as well as emissions due to traffic (Koalitionsvertrag 2005, p. 56), that renewable technologies had to be expanded and could be a valuable export product (Koalitionsvertrag 2005, p. 42), and that they wished to reduce global greenhouse gas emissions by creating an international climate protection agreement for the period after 2012 (Koalitionsvertrag 2005, p. 54).

On 3 December 2007, after 14 years under the same Prime Minister, the Labor Party won the election in Australia. With this election, a long period of economic focus in politics ended (see, for example, Taylor 2014, Crowley 2007 and Hamilton 2001). This could be seen as a turning point in Australian politics, because the central message of the Labor Party’s candidate Kevin Rudd’s election campaign was that “climate change is the greatest moral challenge of our time” (Gurney 2014, p. 3). So climate change became the defining issue in an

Australian political campaign after 14 years without a single vote on the issue (see, for example, Gascoigne 2008 and Bongiorno 2008).

What do these short descriptions of the two elections (in Germany and in Australia) show? They show that climate change is a political issue and was a topic in the election campaigns in the two countries – but each had a different focus. While this was just one of many topics in Germany, it was the key issue in the Australian election campaign. But how was climate change as a political topic picked up by the media in the two countries?

Since the 1980s, the decade in which climate change entered the public discourse worldwide, discussions about its existence, its causes and consequences have continued. These discussions have resulted in different approaches to how to tackle climate change in countries throughout the world and, also in differing coverage of climate change in the media.

Shortly before this research began, the topic of climate change gained a negative connotation. The United Nations Climate Change Conference 2009 in Copenhagen took place – with more than 100 heads of state and government and with more than 40,000 participants this was one of the best visited climate conferences ever (Sterk et al. 2010, p. 3) – and failed. “Rarely had an event generated so much anticipation, and rarely had there been such a strong disappointment... the conference produced even less of a result than even the worst pessimist had expected” (Sterk et al. 2010, p. 3). The fact that the participants at COP 15 saw the task of tackling climate change as an economic burden and that climate change was still not perceived as an overriding concern (Sterk et al. 2010, pp. 9 f.) resulted in a media environment in which controversies about the very existence of climate change emerged.

“Various actors, some of whom were climate scientists, worked strategically to promote, maintain, destabilise and repair the scientific consensus at this time. ...In so doing, these actors drew on coordinated and sophisticated communication strategies, using the rhetoric, methods and methodologies of climate science, to make their respective cases” (Hollimen 2012, pp. 3 f.).

The controversial discussions in newspapers and on radio and television programmes, at that time, as well as the public debate that took place after COP 15 (Hollimen 2012, p. 2) once again identified the power of the media when it comes to framing climate change.

Therefore, the key questions of this research deal with media frames/frame sub-dimensions connected with climate change, the role of climate scepticism in the discussion as well as the question which actors represent the identified frames/frame sub-dimensions.

Some of these questions had also been addressed by other scientists. For example, Kaiser and Rhomberg (2016) did their research on climate change scepticism in the media during the climate change conference in Durban, Brüggemann and Engesser (2017) analysed the IPCC stance on climate change in various countries, and Wessler et al. (2016) recorded cross-national similarities in multimodal framing during a climate change conference. Thus, the findings of this research are comparable to other scientific work that took place around the same time. Chapter 7: “Climate change research since 2011” further introduces these activities in media science and connects the results of this research with the results of work developed by others, after 2011 – so after the research period of this work ends.

To help readers understand the scientific process of this research, the theoretical approach is divided into two parts: chapter 2 consists of a literature review about framing, chapter 3 introduces literature which explains the concepts of Bräuer and Wolling’s (2014) six sphere model (see Chapter 3). Both chapters, thus, introduce the state of research on climate change coverage and its influencing factors at the time when climate change-related coverage of the elections and the environmental disasters was published, i. e. between July 2007 and June 2011.

The question as to whether events, other than climate change conferences, might affect the media coverage of climate change has, nevertheless, only rarely been discussed. Gurney (2014) is one of these few examples. She compared the 2007, 2010, and the 2013 elections in Australia in terms of climate change coverage during the election periods.

This research breaks the international topic of climate change down into a discussion about climate change coverage in two countries, i. e. Germany and Australia. In this context, the two chosen events – the environmental disaster as well as the political election as an event that represents climate change in politics – serve as indicators for the prominence of climate change in the media: The coverage of the environmental disaster makes clear whether Germany and Australia identify environmental disasters as caused by climate change. The coverage of the elections shows whether and how climate change was discussed by politicians as well as by other actors in the two countries around an election.

Because the examination of climate change coverage mainly refers to the analysis of coverage in the context of climate conferences, so far (see Chapter 3), the identification of differences and similarities in the two countries in the context of an event representing social and economical consequences (environmental disaster) as well as an event representing political and medial consequences (election campaign) is a new perspective in research on climate change coverage.

That this new perspective in research of climate change coverage is of interest is supported by four aspects: First of all, the different experiences with extreme weather events and differences in the way the political elites of the two countries deal with climate change. Most Australians say that they do not realise that their weather is getting more extreme because extreme weather conditions, such as cyclones and drought, are part of their everyday life: Australia has a cyclone season that officially runs from November to April (Australian Government – Bureau of Meteorology 2020a) as well as drought maps which monitors three-monthly rainfall deficiencies for Australia (Australian Government – Bureau of Meteorology 2020b). Concerning climate change in politics, the impression is that the commitment of the public to climate change is very dependent on how the respective Prime minister treats the topic during the time, he/she is in office (see, for example, McDonald 2012, p. 579). Second, the exemplary function of the two industrial countries Germany and Australia is of interest: Germany is the biggest economy in Europe, Australia is the biggest economy in the South Pacific region (DeStatis 2018). In addition, the two countries are one of the biggest emitters of greenhouse gases in their region with Germany producing about 800 million tonnes (biggest emitter in Europe) and Australia producing about 500 million tonnes (second biggest emitter in the South Pacific region, after Indonesia) (Länderdaten 2018).

Third, the geopolitical situation shows considerable differences: on the one hand, it is said that Germany is getting more and more Mediterranean with changing seasons, longer heat waves and strong rain (see, for example, DWD, Greenpeace). On the other hand, Australia is getting hotter and hotter including record heat waves, once-in-a-century floodings, bush fires as well as spring tides (Deutschlandfunk 2019).

And fourth, the two countries have different media systems as Germany's media landscape includes a number of media corporations whereas Australias media system just includes two huge media conglomerates, that is to say Fairfax Limited and News Corp (see, for example, Lidberg 2018).

These four aspects make clear that there is not only the question about the differences and similarities comparing the two countries, but also the differences and similarities of the two events as well as of the timeframes within the event. To get profound insights into the climate change coverage around the two events, this work analyses which story is narrated around the words "climate change" and "global warming" in German and Australian climate change coverage, using the following three research questions:

1. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the two countries and how can the observed differences be explained?
2. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the election and the environmental disaster and how can the observed differences be explained?
3. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the time before and after the respective events and how can the observed differences be explained?

These three research questions are answered looking at the following three aspects: first and foremost, this comparative analysis looks at the framing of climate change in leading quality daily newspapers in the two countries. In addition, this work identifies the relevant actors involved and how they deal with the issue. Because actors of climate change coverage have different interests regarding climate change, all articles were examined in terms of their form of expression. Thus, for this research two dimensions of journalistic forms of expression are distinguished: commenting and informing.

Therefore, this research aims on answering three additional questions:

- Do the frames/frame sub-dimensions differ between the quality newspapers in the countries?
- Which actors represent the climate change frames/frame sub-dimensions?
- Which form of expression (commenting/informing) is more frequently used comparing the countries and the two events?

By taking this broad approach concerning the analysis of climate change coverage, this research fills a gap in climate change research in media science.

Chapter 2 provides an overview on framing research. It examines different approaches to gathering frames, explains the process of framing, and provides a literature review on the research of framing climate change in media coverage. Finally, it introduces all identified frame sub-dimensions for this research.

Chapter 3 introduces existing climate change related literature using the “Extended Sphere Model” of Bräuer and Wolling (2014) as guideline. So, this chapter provides an overview of the state of research on climate change coverage in Germany and Australia during the period of this research and oriented towards the six spheres of Bräuer and Wolling (2014). Conse-

quently, it examines groups that might exert influence on climate change coverage in Germany and Australia, i. e. politicians. Therefore, also the history of German and Australian climate change politics, with a focus on the history of this research period, is presented as well as the work of lobby groups. It also introduces relevant economic factors in the two countries, such as those related to energy supply, natural resources and climate conditions. Moreover, Chapter 3 examines possible influences from inside media companies, i. e. that of newspaper owners, and provides an overview of the journalistic profession in the two countries, including the journalists' attitude to their work, their socialisation, their self-understanding and the news values which are evident in the two countries. Finally, it introduces the four newspapers which were analysed in this research.

Chapter 4 connects the theoretical findings from Chapters 2 and 3 with the goals of this research and, thus, identifies the central hypotheses as well as sub research questions for this study.

Chapter 5 presents the research sample and shows how the code book for the analysis is developed. Moreover, it describes the process of coding. Several examples are given.

Chapter 6 – the analysis chapter – discusses the hypotheses and sub research questions by analysing 1,012 articles from Germany and Australia. It concentrates on the usage of the identified frame sub-dimensions and identifies frames used in the climate change debate, on actors which have a say, and on the form of expression used.

In Chapter 7, the climate change studies since 2011, the year in which the investigations covered in this research end, are introduced and reviewed. Moreover, a connection is made between these research findings and the results of this research.

Chapter 8 discusses the findings of this research, reviewing the confirmed and unconfirmed hypotheses and sub research questions. It draws conclusions and explains how these findings may influence further research. In addition, it considers the climate change studies since 2011 and matches the results of these studies with the theoretical framework. Finally, it discusses the limitations of this study and makes recommendations for further research.

2. Theory: Framing

This research concentrates on frames as well as frame sub-dimensions of climate change spread by the media. For understanding the topic of framing, this chapter explains how framing works, shows different methods of framing, explains the process of framing, identifies frames of climate change from several studies and, finally, introduces the deductively found frame sub-dimensions for this research.

The media apply frames by selecting, highlighting and leaving out aspects of news topics (see, for example, Tankard et al. 1991, Reese 2001, De Vreese 2005). Thus, there is a focus on a special opinion, a detail of an issue or a selective interpretation. Entman et al. (2009) say that framing guides topics in a specific direction by using repetition and moral support:

“A frame repeatedly invokes the same objects and traits, using identical or synonymous words and symbols...to promote an interpretation of a problematic situation or actor and (implicit or explicit) support of a desirable response, often along with a moral judgement that provides an emotional charge” (Entman et al. 2009, p. 177).

This kind of guidance referring to media framing was and still is discussed by many researchers (see, for example, Steinberg 1998, Scheufele 2004 and Bach et al. 2012). Steinberg (1998) says that “...frames provide a diagnosis and prognosis of a problem and a call for action to resolve it” (p. 846). Scheufele (2004) argues that the beliefs, valuations and decisions of the receiver are influenced in the long term by representing a topic again and again in the same way (p. 38). Thus, the receiver learns how to classify the information in a message and can recall this message when other information has a similar connotation. For Bach et al. (2012), framing does not only organise media content and makes it easier to understand; it also creates knowledge and the possibility to valuation for the receivers of frames (p. 197). Thus, the work of the media facilitates the classification of news topics and makes them easier to understand.

Summarising these statements, media frames:

- analyse problems,
- are influential due to repetition,
- organise media content,
- create knowledge, and
- call for action.

These characteristics of media framing illustrate the fact that framing is a powerful tool.

Media frames, however, are not just simply initiated by the media as a socialisation tool. Media frames are also the result of political public relations, of public expectations and a country's position, on the one hand, and the result of a journalistic setting and the influence of media owners, lobby groups and so on, on the other hand (see, for example, Reese 2001, De Vreese 2005, Hänggli 2011). Hänggli (2011), who did her research on how political actors shape the news, explains: "...The best way to understand the role of the news media is to view it as part of a larger contest among political antagonists for the control of the public agenda and the public's interpretation of specific policy issues" (p. 2).

This makes clear that framing is not only an instrument that makes media content easier to understand. The senders of media frames, frequently political antagonists – politicians, political organisations or the media owner him- or herself – use framing for their own interests. This strategy is effective because people prefer quick and easy information, so-called heuristics, which "...are mental rules of thumb which allows us to make simple judgements based on complex information" (Pennington 2000, p. 82). And these heuristics are effective because media consumers often lack time or suffer from information overload, so that heuristics help to simplify the amount of information by "... [reflecting] your own experience of the world and may lead to erroneous or biased inferences or judgements because of this" (Pennington 2000, p. 80). This demand for 'comfortable' information as well as the lack of time makes it easy to influence societal values and beliefs:

"In many ways, we [the public] are cognitive misers – we are forever trying to conserve our cognitive energy. Given our finite ability to process information, we often adopt the strategies of the peripheral route for simplifying complex problems; we mindlessly accept a conclusion or proposition – not for any good reason but because it is accompanied by a simplistic persuasive device" (Pratkanis and Aronson 1992, p. 62).

Taking a brief look at how much media framing is able to influence people's lives, Bennett (2002), Carvalho and Burgess (2005) and the Project for Excellence in Journalism (2006) discussed the role of media in people's lives. Bennett (2002) explained that "few things are as much a part of our lives as the news...it has become a sort of instant historical record of the pace, progress, problems, and hopes of society" (p. 10). Carvalho and Burgess (2005) point out that "traditional print and broadcast media, embracing new information and communication technologies, play a central cultural role in modernity through the selective provision of social knowledge" (p. 1459). And the Project for Excellence in Journalism (2006)

concluded that in what are conventionally regarded as ‘developed nations’, many polls have found that television and daily newspapers are the primary sources of information.

That media is the primary source of information is an important aspect, because it means that media can also be labelled as a service provider to the public: “Differentiated audiences initiate demand and are able to result persuasion and react to what the media offer” (McQuail 2010, p. 88). So, the creators of media content cannot just publish what they like. When creating news, when building frames, journalists have to refer to the predominant ideologies, hegemonic structures and the popular culture of the respective country (see, for example, Reese 1990, Pan and Kosicki 1993, Steinberg 1998, Cottle 2000, Hermes and Dahlgren 2006). Reese (1990) argues that news media “...reproduce a consistent ideology without being instructed directly by the state” (p. 394) and “... accept the frames imposed on events by officials and marginalise and delegitimise voices that fall outside the dominant elite circles” (p. 394). Pan and Kosicki (1993) explain that “the domain in which the news discourse operates consists of shared beliefs about a society” (p. 57) and that frames, consequently, show “...how public discourse about public policy issues is constructed and negotiated” (Pan and Kosicki 1993, p. 70). Cottle (2000) especially supports the “...culturally mediating nature of news...” (p. 429) saying that the news is “...not just as a cipher of social interests and political power but... a cultural medium of communication” (p. 429). Hermes and Dahlgren (2006) discuss political debates in the news and explain that “...all the articles in this issue... share a notion of the importance of thinking meaning-making and belonging from a perspective in which power, power relations and identity construction are important” (p. 261). So, framing, besides meeting the requirements of political antagonists, also means reflecting the opinions and beliefs of society to achieve acceptance. This is why the assumption is that the content of the chosen four quality newspapers, which all have a great purview, also have a high degree of acceptance in society.

Summarising this short introduction, media frames analyse problems, are influential due to repetition, organise media content, create knowledge, and calls for action. As a facilitator of frames, the media is, thus, an influential institution in society. This system is socialised by powerful interests as well as by a country’s hegemonic structures and its popular culture, as the latter two are both represented in and distributed via the media.

In terms of this work, the decision to use framing for climate change coverage is based on three arguments:

First, climate change coverage is subject to interpretation. Especially those actors who speak on behalf of climate change in the media – that is to say mainly journalists and politicians –

simplify scientific results; while scientist also refer to uncertainties. Journalists and political actors prefer clear messages (see, for example, Boykoff and Timmons 2007, Weingart et al. 2000). Journalists, in addition, follow professional routines and emphasise for example conflicts, drama and personalisation in terms of climate change (see, for example, Boykoff and Boykoff 2007). So, framing represents the dominant messages of the political elites as well as the routines of the journalist.

Second, framing is the result of these interpretations from dominant actors to create one central message in terms of climate change – in this case a central message for a newspaper article. Based on that, journalists work out patterns of interpretation which explain the reasons, the process as well as the consequences of certain events considering the cultural context and the political orientation of the respective media company (see, for example, Reese 2001, p. 11, Badr 2017, p. 178).

Third, framing includes the concept of “frames within frames” (Goffmann 1974) – so to identify different frame sub-dimensions standing for one frame. A frame is, consequently, interpreted differently referring to a particular event and, thus, highlights the event differently referring to the respective conceptional framework (see, for example, Roessler 2005, p. 230, Van Gorp 2007, p. 70). This characteristic of framing is relevant for this work due to the two events on which this research focuses.

Matthes and Kohring (2004) agree to Goffmann’s (1974) frame concept on “frames within frames”. Building on the definition of framing by Entman (1993), they developed a methodology which understands frames as a set of relating sub-frames (Matthes and Kohring 2004, p. 61). Thus, frames are not identified holistically via a content analysis, but are identified across several texts using the statistical practice of a hierarchical cluster analysis. Accordingly, clusters are a composition of specific frame elements (Matthes and Kohring 2004, p. 62). For Matthes and Kohring (2004), this method does not fully solve the problem of a valid identification of frames, but the coding of single frame-elements is at least less complicated and easier to standardise than coding a full frame (p. 63). In addition, the authors say that this method improves the reliability of each frame, because the coder does not know on which frame he/she is working while coding (Matthes and Kohring 2004, p. 63).

In the following, this chapter extends the knowledge about the methodology of framing and it introduces media frames which create the dominant ideology about climate change. It, therefore, first studies the process of framing and explains how frames are created and received by the protagonist of a media process. Second, this chapter discusses framing approaches and introduces Entman’s (1993) definition of framing as a starting point for this

research. Then, third, the framing of climate change is analysed. In the fourth part of this chapter the findings are classified into a consistent list of frame sub-dimensions, referring to Entman's (1993) frame elements, to deductively identify climate change frames for the code book of this research on German and Australian climate change coverage.

2.1. Framing as a process

Although this research is about the creation of media frames and examines just the representation of one issue in the media – in this case the representation of climate change – this chapter explains the process as a whole for a better understanding of how framing works.

Scheufele (1999) intensively discusses the framing process. He creates a process model of framing (see Figure 1) which "...conceptualizes framing as a continuous process where outcomes of certain processes serve as inputs for subsequent processes" (p. 114).

For him, there are four major processes influencing framing: "Frame building", "Frame setting", "Individual-level effects" and "journalists as audiences" (Scheufele 1999, pp. 115 ff.). "Frame building" makes clear which factors, either organisational, media or external factors, impact the framing of news content that journalists create (Scheufele 1999, p. 115). "Frame setting" refers to the salience of issue attributes, i. e. the accessibility of frames in the mind of the receivers (Scheufele 1999, p. 116). "Individual-level effects" have assumed a link between media frames and individual-level outcomes, i. e. behavioural, attitudinal and cognitive variables (Scheufele 1999, p. 117). The last part, "journalists as audiences", say that journalists are susceptible to frames set by the news media (Scheufele 1999, p. 117).

This last aspect of Scheufele's (1999) findings is further explained by Bach et al. (2012) who use Scheufele's process model for their own research on media coverage of the financial crisis. The authors say that journalists, as receivers of media content, also create new media content from their cognitive processing (Bach et al. 2012, p. 198) as well as through professional interaction with other journalists in the newsroom (Bach et al. 2012, p. 199). The work of journalists is, therefore, not only influenced by the elites of a country and by journalistic routines, but also by own thoughts about what the journalist has heard.

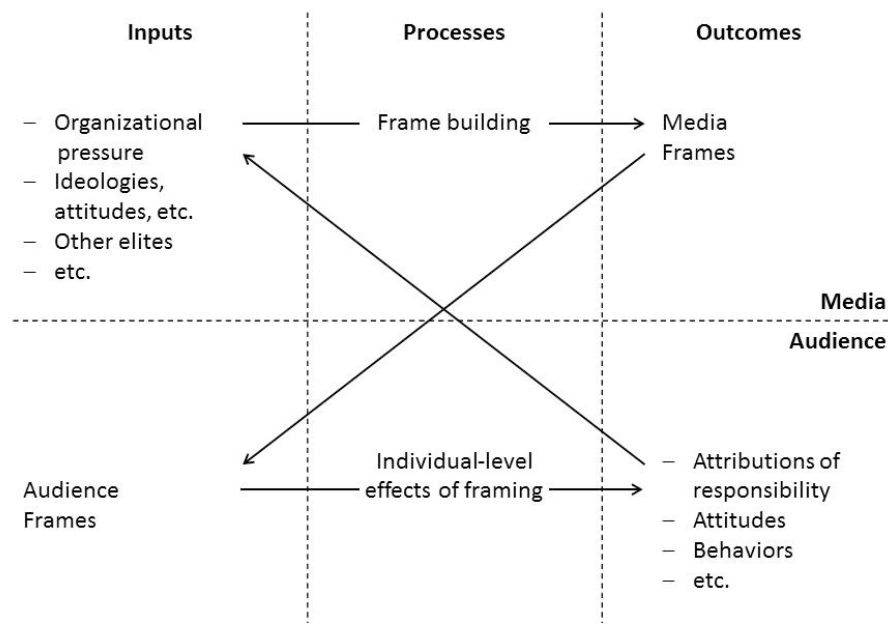


Figure 1: A process model of framing research

Source: Scheufele 1999, p. 115

Because this work is on “frame building”, this process is introduced in more detail in the following. “Frame building” is a process that is influenced by various aspects. De Vreese (2005) says that the frame-building process takes place in a continuous interaction between journalists, elites and social movements (p. 52) and says: “The outcomes of the frame-building process are the frames manifest in the text” (De Vreese 2005, p. 52). Scheufele (1999) explains that it is a process “...that influences the creation or changes of frames applied by journalists” (Scheufele 1999, p. 115). He, thus, puts the journalist in the centre of the framing process.

Hänggli (2011) explains the mechanism of “frame building” as follows: “Frame building uses media frames as dependent variable and investigates the factors that influence the creation or changes of frames applied by journalists” (Hänggli 2011, p. 1). From Hänggli’s point of view, political actors introduce the most important frames into the public discourse (2011, p. 3). Nevertheless, although organisations are influential, sometimes those who stay incognito for the public are especially successful (Hänggli 2011, p. 4).

Matthes and Kohring (2004) say that frames in a media context can be located at four points of the communication process: at the sender, at the journalist, in the media content/article, and at the receiver of a message (p. 56). The sender as well as the journalist are the builders of frames. The sender, for example a political actor, frames strategically a special viewpoint on a topic and frames in the context of a competition to other senders who have a different viewpoint concerning the same issue (Matthes and Kohring 2004, p. 56). Journalists frame in terms of their way of composing a news story and of deciding which news item is newsworthy (Matthes and Kohring 2004, p. 56). The result of these activities of the senders and the journalist is that media content or an article is framed by focusing on one central message; it is about the story line (Matthes and Kohring 2004, p. 57). Or as Tankard et al. (1991) states: a media frame as the central organising idea for news content supplies a context and suggests the central issue by using selection, emphasis, exclusion, and elaboration (Tankard et al. 1991, p. 3).

These short introduction about “frame building” makes clear that it is also of major importance to also identify the actors of frame sub-dimensions, because the coding of actors helps to get an impression about 1. the powerful interests in terms of climate change coverage and 2. the significance of journalists as authors of climate change coverage.

2.2. Framing approaches

This chapter introduces approaches for identifying frames. It thus shows the diversity of the method of framing and helps to find the best method for this research.

One approach that can be taken in a frame analysis is the *qualitative-interpretative* approach. This approach focuses on the interpretative account of media texts and is based on a small sample that mirrors the discourse around an issue or event: “Typically, frames are described in-depth, and little or no quantification is provided” (Entman et al. 2009, p. 180). Because the idea is that metaphors, examples, pictures and so on define a frame, this analysis examines each paragraph of an article, not the article as a whole, to identify a frame (Entman et al. 2009, p. 180).

The *manual-holistic* approach assumes that frames are manually coded as holistic variables in a quantitative content analysis, either inductively, so *ex ante*, or deductively (Entman et al. 2009, p. 180). Entman et al. (2009) explain that this approach first generates frames by a qualitative analysis of a selection of news texts which are then used for a quantitative content analysis (p. 180). So, a text is analysed by the list of frames found. Alternatively, frames can be identified and defined while analysing a text (Entman et al. 2009, p. 180).

For Matthes and Kohring (2004), the *deductive approach* is useful. First, the researchers deduce frames from the literature and, second, code frames using a content analysis (Matthes and Kohring 2004, p. 60). Matthes and Kohring (2004) say that it is necessary for this approach that all previously defined frames can be related to the research topic – so that the frames are generic (p. 60). The advantages of this approach are that objectivity as well as that reliability are ensured; however, as a disadvantage, Matthes and Kohring (2004) state that only frames that have already been defined can be examined (p. 60).

The *manual-clustering* approach is a standard quantitative content analysis with variables that are subsequently factored and cluster-analysed, which means that there are frames in variables or elements that are clustered in frames (Entman et al. 2009, pp. 180 f.).

The *computer-assisted* approach neither investigates frames holistic nor single frames or variables, but examines specific vocabularies and word families in the text, such as “charity”, “charities”, “charitable” and so on, with the help of a computer (Entman et al. 2009, p. 181). Matthes and Kohring (2004) call this approach *frame-mapping*. The authors extend the computer-assisted approach taken by Entman (2004) by not only looking at special word groups identified by using computer-based algorithms but say that this quantitative type of examination also uses computers to extract text material that examines the word diction (Matthes and Kohring 2004, p. 59). For Matthes and Kohring (2004), this approach is the only objective one because human opinion or interpretation cannot influence it (p. 59). Nevertheless, this approach might not be able to establish a connection between different words to identify a central organising idea, as Tankard et al. (1991) demands from a media frame (see Chapter 2.1). Moreover, this method might not be able to identify words with transposed letters.

Another approach is the *text academic* one. It identifies frames based on the selection, placement and structuring of words and phrases (Matthes and Kohring 2004, p. 57). The advantage of this approach is that news text can be systematically and empirically analysed as well as dismembered; the disadvantage is that this method is very time-consuming and that it is not clear which words or phrases represent a frame and that makes it quite a subjective approach (Matthes and Kohring 2004, p. 58).

The *interpretative-quantifying* approach starts with an inductive selection of frames and goes on with a content analysis in which these frames are coded and quantified (Matthes and Kohring 2004, p. 58). As a disadvantage of this kind of framing, Matthes and Kohring (2004) say that these frames are not explicit and that the criteria for identifying these frames is not clear (pp. 58 f.). The authors argue that this approach results in “Forscher Frames [scientist frames]”, not in media frames (Matthes and Kohring 2004, p. 59). In addition, Matthes and

Kohring (2004) state that the inductive selection of frames at the beginning of such a framing approach results in expectations about the appearance of frames and could make researchers blind to new frames in the media content (p. 59).

These framing approaches show that there are *four dimensions that must be differentiated*:

1. Inductive versus deductive

Frames can either be defined while analysing a text (inductive) or researchers deduce frames from the literature/theory (deductive).

2. Complete frames versus frame elements

Frames can be either information maps (complete frames) or structured words and phrases (frame elements).

3. Qualitative versus quantitative

Frames can either be identified using an interpretative account of media texts (qualitative) or are factor and cluster-analysed (quantitative).

4. Manual versus computer-assisted

Frames can be examined manually with a standard quantitative content analysis or with a computer that examines specific vocabularies and word families in the text.

For this research on German and Australian climate change coverage, a manual deductive-quantitative approach identifying frame elements is used. Therefore, this research takes the definition of communication scientist Robert Entman (1993) as a starting point for its methodology. For Entman (1993),

“[to] frame is to select some aspects of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” (p. 52).

Thus, for Entman (1993) a frame could consist of four different aspects that include naming an issue, defining the responsibility for this issue, giving this issue a moral aspect and calling for action. Lately, Matthes (2014) discussed Entman’s (1993) definition and carefully distinguished between the four characteristics of a frame. He explained that “problem definition” is a definition of a thematic section, either with a positive or a negative connotation, its actors and it emphasizes relevant information; “causal interpretation” refers to the responsibility of an actor; the “treatment recommendation” defines a solution as well as a call for

action; and the “moral evaluation” is a moral/evaluative classification of the basic issue (Matthes 2014, pp. 11f.).

Besides Entman’s (1993) definition, there are also other explanations of framing (see, for example, Reese 2001, De Vreese 2005, McCombs 2005). Reese (2001) characterises frames as “...*organising principles* that are socially *shared* and *persistent* over time, that work *symbolically* to meaningfully *structure* the social world” (p. 11). Reese (2001) further explains that the word “organising” stands for the activity in generating meaning (p. 12), the term “principle” refers to the abstract quality of frames (p. 14), “shared” decides whether a frame is a useful and noteworthy organised device (p. 15), “persistent” means persistent over time and instances (p. 15), “symbolic” explains how frames are manifested and communicated in their various forms (p. 16), and “structure” says that frames impose a pattern of the social world (p. 17).

Reese (2001) asks “what power relationships and institutional arrangement support certain routine and persistent ways of making sense to the social world” (p. 19) and, thus, show that “...frames are connected to asymmetric interests” and for framing one needs “...access to resources, a store of knowledge, and strategic alliances” (p. 19). So, for Reese (2001) frames are always a result of external influence by powerful elites, rules and dominant ideologies. He shares this concept with De Vreese (2005), who explains that “frames are parts of political arguments, journalistic norms, and social movements’ discourse. There are alternative ways of defining issues, endogenous to the political and social world” (p. 53).

McCombs (2005) says that “a frame is an attribute of the object under consideration because it describes the object” (p. 546). For him, the term attribute in terms of framing is, however, specially defined: a frame is the predominant attribute in a message (McCombs 2005, p. 546).

Entman’s (1993) definition of framing is the most suitable because it concentrates on the connotation and effects of an issue. Because climate change is a matter of interpretation and viewpoints about causes and effects, Entman’s four frame dimensions offer a very useful way to structure this topic. In addition, this definition is pervasive and, thus, supports the claim to integrate different scientific disciplines (Matthes and Kohring 2014, p. 62).

Based on Entman’s (1993) four frame dimensions “problem definition”, “causal interpretation”, “moral evaluation”, and “treatment recommendation”, this research, first, collects frame sub-dimensions from the literature (see Chapter 2.4) and, second, extends the list while coding a sample of climate change articles from Germany and Australia. With the

resulting list of frame sub-dimensions, the defined articles are coded in the context of an election as well as an environmental disaster.

2.3. Framing climate change

This chapter examines media frames about climate change based on the literature. Because there is little literature on this issue in Germany and Australia, this chapter also examines it at an international level. With this literature review, this chapter has not only the goal to provide an overview of the current stage of research on framing climate change in the media, but also records climate change frames from previous research as a starting point for this study.

For *Germany*, the only study during the period of analysis of this research was conducted by Arlt and Wolling (2012). They provide a content analysis of the “Press Coverage of the Copenhagen Climate Change Conference”. For the authors, these annual climate change conferences offer a way to put climate change – a topic which is usually below the attention threshold – back on the media agenda and, thus, also back on the agenda of political actors (Arlt and Wolling 2012, p. 286). According to Arlt and Wolling (2012), one major task of the media coverage during the climate change conferences is that the media transparently discusses four aspects of climate controversy. These are “anthropogenic climate change”, the “responsibility for the causes of climate change”, the “expecting effects of climate change” and the “efficiency of measures (adopted) to tackle the causes and effects of climate change” (pp. 287 f.).

Concerning the “responsibility for the causes of climate change”, Arlt and Wolling (2012) define two viewpoints: on the one hand, there is the historic perspective which blames industrial countries and, on the other hand, there is the perspective which blames the populous emerging countries which produce high levels of emissions, such as China, India and Brazil (p. 288). Expected results differ from country to country in terms of an increase in average temperatures with different consequences – ranging from life-threatening to profitable (Arlt and Wolling 2012, p. 288).

Concerning the “efficiency of measures (adopted) to tackle the causes and effects of climate change”, there are two major strategies: mitigation, i. e. measures designed to reduce greenhouse gas emissions, and adaptation, such as the protection of coastlines as well as the conversion of forestry by planting trees which are better able to thrive in the new climate conditions (Arlt and Wolling 2012, p. 288). Based on these definitions of climate controversy, Arlt and Wolling (2012) have two research questions: 1. Does the media use the climate

change conference as a means to put climate change on the agenda? And, 2., how does the media represent the causes and expected results of climate change as well as the efficiency of measures used to tackle the causes and results of climate change? (p. 288).

The authors make a quantitative content analysis of the 15th United Nations Climate Change Conference in Copenhagen, reviewing the national quality daily newspapers *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* as well as the three weekly news magazines *Der Spiegel*, *Focus*, and *Zeit* (Arlt and Wolling 2012, p. 289). The findings of these newspapers and magazines are set in contrast to two regional daily newspapers from Thuringia: *Freie Wort*, which is part of Süddeutsche Verlag, and *Thüringer Allgemeine*, which is part of WAZ Group (Arlt and Wolling 2012, p. 289). The research period was between 16 November and 31 December 2009 – i. e. three weeks before the climate conference started, at the time when the climate change conference took place and about two weeks after the climate conference (Arlt and Wolling 2012, p. 289). All the articles used for this research refer to the United Nations Climate Change Conference at least once, which resulted in 600 articles (Arlt and Wolling 2012, p. 290). Arlt and Wolling (2012) decided that all articles of the regional daily newspapers and the weekly news magazines should be coded as well as every second article in the national daily newspapers (p. 290). Finally, 394 articles were used as the basis for Arlt's and Wolling's (2012) research, and these were coded by 21 trained students (p. 209).

Arlt and Wolling's (2012) results show that the print media not only documented the climate change conference, but also the topic of climate change, in general: in 51 per cent of the coverage this was the case, while in more than half of all articles the causes of climate change were referred to, mainly in the weekly news magazines (p. 291). Non-anthropogenic climate change and, thus, the "uncertainty discourse" was rarely mentioned; it appeared mainly in the weekly news magazines (Arlt and Wolling 2012, p. 291). Seen as responsible for climate change are mainly industrial countries, followed by emerging and developing countries; consequently, the historic perspective dominates (p. 292). As expected results of climate change, negative consequences dominate (in more than 50 per cent of all the articles analysed). The weekly news magazines in particular report intensively on negative results with differing coverage (Arlt and Wolling 2012, p. 292).

The measure to "tackle the causes and effects of climate change" mainly examines prevention and mitigation at an international level, with a focus on abstract political measures, such as the definition of an emission limit and a climate change policy (Arlt and Wolling 2012, p. 293). It was mainly daily newspapers that reported on such preventative measures (Arlt and Wolling 2012, p. 293).

To understand the climate controversy, Arlt and Wolling (2012) also examined which actors were part of this controversy and discover that they mainly come from governments; scientists and economic actors only play a minor role in the basic coverage (p. 294).

Summarising Arlt and Wolling's results (2012), their examination shows that the media inform their readers substantially about the reasons, causes and results of climate change; there is no "uncertainty discourse" which could encourage political actors to demand or take measures against climate change mitigation (p. 295). In addition, there are few references to adaptive measures which could support global disengagement in terms of climate change (Arlt and Wolling 2012, p. 295). Moreover, the coverage was differentiated without questioning the fact that climate change is anthropogenic (Arlt and Wolling 2012, p. 295). They also say that, due to the homogenous coverage of climate change in Germany, the country's political actors were able to speak openly about their climate change position (Arlt and Wolling 2012, p. 295). As a negative aspect, Arlt and Wolling (2012) say that the coverage does not address concrete measures for tackling climate change (p. 295). Actors which appear are the government, scientists and economic actors.

Arlt's and Wolling's (2012) content analysis provides a good overview of the state of the German climate change discussion. However, their results just refer to the context of a climate change conference and, thus, concentrate on an exceptional situation in which climate change is supposed to be a major topic in the media. In addition, Arlt and Wolling (2012) just look at single frame elements and do not determine frames.

One study about *Australia* was done by McGaurr et al. (2013). In their work they analysed risk, uncertainty and opportunity in climate change coverage. The authors investigated the newspaper climate science coverage in six countries from 2007 to 2012 (McGaurr et al. 2013, p. 22). In their comparative study, they looked at four predefined frames which are "uncertainty", "explicit risk", "disaster/implicit risk" and "opportunity" (McGaurr et al. 2013, p. 23).

The international sample which was analysed by McGaurr et al. (2013) comprised around 350 articles from three newspapers in each of six countries (Australia, France, India, Norway, the UK and the US) – normally one right-leaning, one left-leaning and one tabloid or business paper; in the Australian study this included *The Australian/Weekend Australian*, *Herald Sun/Sunday Herald Sun* (Melbourne) – a tabloid – and *The Sydney Morning Herald/Sun-Herald*, including the Sunday editions of the newspapers (pp. 23 f.).

For their content analysis, McGaurr et al. (2013) used the search engine *Newsbank*, using different indicators for defined frames. Indicators of the "uncertainty" frame included ranges

of projections, the presence of sceptical voices or conflicting experts as well as words such as “may”, “possible” or “uncertain” in the coverage; the “disaster/implicit risk” frame included issues such as sea-level rise, more floods, water or food shortages, and population displacement, “explicit risk” refers to articles in which the word “risk” was used, where the odds, probabilities or chance of something adverse happening are given or where every day concepts or language relating to insurance, betting or the precautionary principle are mentioned; the “opportunity” frame included two types of opportunities: those accruing from doing something to reduce the risks from greenhouse gas emissions (the advantages of any move to a low-carbon economy) and those accruing from climate change (such as longer growing seasons in the northern hemisphere, or the prospects of new shipping routes and the possibility of mineral, gas and oil exploration in the Arctic) (McGaurr et al. 2013, p. 24).

The different climate change stories McGaurr et al. (2013) examined are the media’s reporting of the IPCC’s first two reports in 2007, which include a huge amount of coverage around the world, as well as initial coverage in November 2011 of the IPCC’s special report on extreme weather and coverage of the report’s official release in March 2012; both are significant due to the explicit inclusion of risk, and the authors look at the reporting of the decline in Arctic sea ice in the past two to three years (p. 24).

The Australian results for the coverage of all IPCC reports show that the “uncertainty” frame was present in 89 per cent of all articles, in a large proportion in the articles about the IPCC’s special report on extreme weather and in 24 per cent of all articles with a dominant tone (McGaurr et al. 2013, p. 27). The “disaster/implicit risk” frame was mainly present (96 per cent) (McGaurr et al. 2013, p. 27). The “explicit risk” frame was present in 50 per cent of the articles – the word “risk” was used frequently (61 times in the 46 articles), while the “opportunity” frame was almost absent (McGaurr et al. 2013, p. 28).

McGaurr et al. (2013) stated: “The sample size is relatively small ...” (p. 30). Nevertheless, there are some noticeable findings about the way climate change news is covered in Australia in their research. For example, there was a high occurrence of the “uncertainty frame”, which signifies that Australia’s news media provides space for the climate-change-sceptical position. On the other hand, there were a large number of “disaster/implicit risk” and “explicit risk” frames, which refer to the consequences of climate change – most of them life-threatening, such as floods, water and food shortages. Discussions about whether climate change is happening, in general, on the one hand, and the representation of life-threatening consequences of climate change, on the other, reflect opposing views in the Australian press. Actors of climate change coverage were not identified.

As already stated in the introduction of this chapter, the literature on content or frame analyses of climate change coverage in quality newspapers is relatively scarce in Germany and Australia. To identify a broader number of frames for this research, the rest of this chapter is about research in other countries.

In her research “Climate of scepticism: US newspaper coverage of the science of climate change”, Antilla (2005) examines the breadth and sourcing of US newspaper coverage relating to climate change and conducts an analysis of the framing of press reports (p. 339). To classify her research, Antilla (2005) explains that “...the US federal government is repudiating the challenge of anthropogenic climate change... [and] powerful forces within society combine to distract both the US public and policy makers from this reality” (p. 383).

The primary source for Antilla’s (2005) frame analysis was the online database *NewsLibrary.com*, with its data collection of 251 US national, regional and community newspapers and, in addition, four newspapers that were not included in *NewsLibrary.com*: the *New York Times*, the *Los Angeles Times*, the *Chicago Tribune*, and *USA Today* (pp. 340 f.). So, 255 newspapers from 43 states and the District of Columbia are the basis for Antilla’s (2005) research on climate science coverage; the research took place from 1 March 2003 to 29 February 2004 (p. 241).

All 251 newspapers in the *NewsLibrary.com* database as well as the electronic versions of the *New York Times*, the *Los Angeles Times*, the *Chicago Tribune*, and *USA Today* were browsed using the search terms “climate” and “change” or “global” and “warming”; political stories, commentaries, editorials, interviews, book reviews, and letters to editors were excluded as well as duplicates (Antilla 2005, p. 341). This resulted in 544 climate science articles of which 246 are unique articles and 298 (55 per cent) are articles that were published in 93 newspapers introducing 32 scientific studies (Antilla 2005, p. 341). Antilla (2005) then does a frame analysis that compares themes and frames within the press with the scientific texts (p. 341). Therefore, “...using the database LexisNexis, I gathered all wire and syndicated news service articles relating to the 32 scientific studies” (Antilla 2005, p. 341).

The issues which received the widest degree of newspaper coverage of climate science were “2003 was third-hottest year on record” (42 articles), “soot is a factor in global warming” (34 articles), and “warming effects on ski resorts” (29 articles) (Antilla 2005, p. 341). Altogether, Antilla (2005) found six broad categories related to climate change and global warming: “effects predicted”, “effects documented”, “anthropogenic causation”, “causation unrelated to CO₂ or methane (CH₄)”, “clean energy or mitigation”, and “adaptation” (p. 341).

For Antilla (2005), these categories stand for four discernible frames which are “valid science”, which is the predominant frame in her research, “ambiguous cause or effects (indicating a degree of disregard for the gravity of climate change)”, “uncertain science” and “controversial science” (p. 344). The “valid science” frame does not discuss scepticism of the research or of climate change, the “ambiguous cause or effects” frame de-emphasises scientific findings and – in sardonic articles – the effects of climate change are obscured (Antilla 2005, pp. 344 f.). The “uncertain science frame” was referred to, despite the fact that the scientific study reported contained no such references, while the “controversial science” frame referred to the issue of balanced reporting and included, for example, rhetoric from climate sceptics with known fossil fuel industry ties (Antilla 2005, pp. 346 f.).

As a result of her study, Antilla (2005) made clear that the science of climate change did not appear to be a prime news topic in most of the 255 newspapers (p. 350). In addition, she discovered that there were a variety of articles that framed climate change/global warming in terms of debate, controversy, or uncertainty and that her research, thus, shows that there are many examples of journalistic balance that led to bias, giving climate sceptics a word, and spreading misinformation via wire or news service providers (Antilla 2005, p. 350). With her research, Antilla (2005), thus, demonstrate that controversial discussions about climate change are also an issue in the US media. Actors of climate change coverage were also not identified.

Good (2008) investigated “The Framing of Climate Change in Canadian, American, and International Newspapers: A Media Propaganda Model Analysis” using Herman and Chomsky’s propaganda model as a theoretical framework (p. 239). She examined the 40 major newspapers of the United States according to *Lexis Nexis*, the 15 major newspapers in Canada based on the *Canadian Newspaper Association*, and 70 major international English language newspapers according to *Benn’s World Media Directory* (Good 2008, pp. 239 f.). All newspapers were analysed in 2007 because it was “...a turning-point year in which there was a general growth in concern about the climate...” (Good 2008, p. 240). Good (2008) uses a number of keywords and keyword combinations, such as “climate change”, “global warming”, “greenhouse effect” to identify frequency and terminology, “climate change” and “science”, “global warming” and “science”, “climate change” and “Kyoto”, “global warming” and “Kyoto”, “climate change” and “politics”, and so on (pp. 241 ff.).

Good’s (2008) first finding was that Canadian newspapers included the words “climate change” and “global warming” much more often in total and per paper (average of 2,650 newspapers/177 times per paper) than American newspapers (average of 2,019 newspapers/50 times per paper) and international newspapers (average of 5,102 articles/73 times

per paper) (pp. 240 f.). The findings also show that, in the United States, the terms “global warming” and “climate change” are used interchangeable (Good 2008, p. 241).

The second keyword search made by Good (2008) examined “social context frames” and identified the fact that in all countries “climate change” and “global warming” are highly connected with “science” (Canada: 19 per cent, United States: 25 per cent, international: 19 per cent of all climate change/global warming stories) (p. 243). So, the dominant role of science in the context of climate change/global warming is accepted. The Kyoto Protocol only plays a minor role in US-American newspapers (3 per cent, Canada: 12 per cent, International: 8 per cent) and “the keywords related to politics and economics were distributed quite evenly...” in all countries (Good 2008, p. 243).

Coming to “causes of climate change”, the third keyword search, Good (2008) detected that “greenhouse gases” are most often referred to and again mostly in US-American newspapers (21 per cent, Canada: 16 per cent, International: 15 per cent), “car”/“vehicle”/“automobile” frames were used likewise in all countries (Canada: 6 per cent, United States: 9 per cent, international: 6 per cent) as well as the “fossil fuels” frame (Canada: 3 per cent, United States: 3 per cent, international: 2 per cent) (p. 244).

The fourth keyword search is important for this research. It refers to the consequences of climate change, but the percentages show that topics such as extreme weather (Canada: 2 per cent, United States: 0 per cent, international: 1 per cent), floods (Canada: 2 per cent, United States: 3 per cent, international: 4 per cent), forest fires (Canada: 0 per cent, United States: 3 per cent, international: 2 per cent), and hurricane/storm (Canada: 3 per cent, United States: 5 per cent, international: 3 per cent) appeared not to be of relevance for the newspapers examined (Good 2008, p. 245). Good (2008) criticises this behaviour of the newspapers, concluding that these aspects of climate change are ignored for economic reasons (p. 246). This is supported by the keywords related to looking for solutions: “energy conservation” (Canada: 0 per cent, United States: 1 per cent, international: 0 per cent), “alternative energy” (Canada: 0 per cent, United States: 1 per cent, international: 0 per cent) and “renewable energy” (Canada: 1 per cent, United States: 2 per cent, international: 2 per cent) are not widely mentioned in the newspaper articles that were analysed (Good 2008, p. 246). And she asked: is the central message of the media “... that it is hugely difficult for the story of climate change to be framed as one of oil reduction solutions?” (Good 2008, p. 246).

For Good (2008), one major result of her research is that “when the frames move into more potentially threatening territory..., such as the linking...with extreme weather or decreasing/different energy use, the story frequency plummets” (p. 248). The examination carried

out by Good (2008) also documents the fact that even in a year which is identified as a turning-point year in terms of concerns about the climate, political and economic aspects dominate coverage of the issue of climate change by focusing on more “true-to-life problems”, such as economic growth (p. 248).

Good’s (2008) research offers new insight in terms of the causes and consequences of climate change. It shows that “greenhouse gases” are evaluated as the main cause of climate change and that the predominant consequence is “extreme weather”. Due to the fact that Good (2008) only examined English-language newspapers in her content analysis (p. 249), her results might also be reflected in the Australian newspapers, which are examined in this research. Actors of climate change coverage were not coded by Good (2008).

In the article “Global warming – global responsibility? Media frames of collective action and scientific certainty”, Olausson (2009) used Entman’s (1993) definition as a basis for her research when examining the representation of climate change in the Swedish press (p. 423). As a method, she adopted critical discourse analysis “...because of its constructionist, socio-cognitive, and critical epistemological pillars that harmonise well with the framing theory ...” (Olausson 2009, p. 424).

Olausson’s (2009) research questions were 1. Which themes and topics are given prominence in the article as a whole and in each paragraph? In this context, she pays special attention to the headlines and introductions where the overarching theme of the article is expressed (p. 424). 2. Which categories are given prominence in the article (p. 425)? In this context, Olausson (2009) also examined local coherence, implicit information, redundant information, choice of quotations, choice of words and rhetoric (p. 425).

For her research, she chose three newspapers, each with a different character: *Dagens Nyheter*, a national daily broadsheet; *Aftonbladet*, a national daily tabloid; and the local newspaper *Nerikes Allehanda* – all three newspapers have a wide circulation (Olausson 2009, p. 425). Her selection consisted of news articles only, and she did not include editorials, columns, or commentaries because she saw these as “argumentative items” (Olausson 2009, p. 425). As for databases, Olausson (2009) used *Mediearkivet* and *Presstext*, looking for the search terms “climate change”, “greenhouse effect” and “global warming” (p. 425). In this way, she generated a corpus of 334 articles, while 193 were excluded because they were in the aforementioned argumentative categories (Olausson 2009, p. 425). Consequently, the three major frames she found were based on 141 news items published over a period of 12 months (1 September 2004 to 6 September 2005) (Olausson 2009, p. 425).

Olausson (2009) wrote that her findings “...display the discursive construction of global climate change as a social problem” (p. 425). So, here results show that the “collective action frame of mitigation” dominates the reporting on climate change which “...reflects the policy agenda, where mitigation of global warming has figured for a much longer period of time than has adaptation to its effects...” (p. 426). This frame of mitigation strongly refers to international political events, for example G8 summits, the Kyoto treaty, emission policies and so on: mitigation is framed as a transnational concern (Olausson 2009, p. 426). The responsibility for mitigating global warming is, however, attached to the institutions of the industrialised countries only (Olausson 2009, p. 426). In contrast to this frame, the “collective action frame of adaptation” refers to recent dramatic weather situations (Olausson 2009, p. 426).

The “frame of certainty” assumes that human-induced global warming is a direct cause of climate change, resulting in dramatic consequences which are already evident (Olausson 2009, p. 429). For Olausson (2009), this result shows that by constructing global warming as a significant issue, there is no room for scientific uncertainties or disputes about the existence of climate change (p. 430).

Olausson (2009) argued that her analysis demonstrates numerous similarities between media and international policy discourse on climate change; however, there was no connection visible between the “collective action frame of adaptation”, i. e. action to adapt society to climate change, and the “collective action frame of mitigation”, i. e. action aiming to reduce greenhouse gas emissions, in the newspapers that she analysed (p. 432). “The two frames exist parallel to each other, in different contexts, hardly ever appearing in the same news items, regardless of the fact that they constitute two sides of the same coin...” (Olausson 2009, p. 432). Thus, for Olausson (2009), one noticeable finding is that there was no connection in the news coverage between the frames of mitigation and adaptation as well as regarding the distribution of responsibility for collective action (p. 432). The “frame of certainty” strengthens the two frames of collective action and comes to terms with climate change, which is a key difference between coverage in the Swedish press and studies of other European media (Olausson 2009, p. 433). Olausson (2009) concluded with the discovery that the tight relationship between political elites, and therefore policymakers, and the media does not offer alternative frames or revolutionary insights into the context of global climate change (p. 433).

In her research, Olausson (2009) makes it clear that the main responsibility for tackling climate change/global warming is delegated to a group of industrialised countries. This result conveys the suggestion that each country can discharge responsibility on a national basis,

referring to the role of international institutions. Another conclusion is that there is no connection between the action taken by people in society to tackle climate change and actions designed to reduce greenhouse gas emissions due to a tight relationship between the political elite and the media. This is critical, because it relieves people from the responsibility of reducing their personal carbon footprint. An additional finding is that the news media in all the countries examined view it as a fact that human-induced global warming is a direct cause of climate change; there is no room for scientific uncertainties or disputes about the existence of climate change.

Nevertheless, Olausson (2009) left out editorials, columns, and commentaries, which represented about 58 per cent of all the articles she found (193 out of 334 articles were excluded). Such commentaries might contain critical statements regarding the existence and/or the causes of climate change, or even climate-change-sceptical positions. In addition, her methodology was qualitative (based on the researcher's interpretation). Her results, moreover, included only basic aspects of Entman's (1993) definition of framing. So, Olausson (2009) combined "treatment recommendation" with responsibility, introducing "The collective action frame of mitigation as a transnational responsibility" (p. 426) and the "The collective action frame of adaptation as a national and local responsibility" (p. 428). She also combined "problem definition" with consequences, i. e. "The frame of certainty" which claims that "...human-induced global warming is a direct cause of climate change, bringing with it dramatic consequences already at hand" (p. 429). Entman's (1993) "moral evaluation" is not represented in Olausson's (2009) study. Actors of climate change coverage were not identified.

Shehata and Hopmann (2012) also reviewed the Swedish and the US press to get insight into how agenda and frame-building processes work in mediated democracies (p. 176). This was interesting to the authors because there is an essential difference between the two countries: "While a broad political consensus among government and opposition parties has characterised Swedish climate change debate for a long time, this has not been the case in the United States" (Shehata and Hopmann 2012, p. 176).

Shehata and Hopmann (2012), therefore, investigated to what extent such political differences were reflected in the climate change coverage of two Swedish elite quality national newspapers – *Dagens Nyheter* and *Svenska Dagbladet* – and two American elite quality national newspapers – *New York Times* and *Washington Post* (p. 176). Shehata and Hopmann (2012) used a content analysis of climate change coverage over a 10-year period between January 1998 and December 2007 (p. 184) for their examination, as well as an intensive content analysis of the Kyoto (1997) and Bali (2007) summits on climate change (p. 176).

Most important for these authors was the investigation of resource use and the presence of several issue-specific frames related to the debate on global warming (Shehata and Hopmann 2012, p. 176). Using Entman's (1993) definition of framing (pp. 178 f.), Shehata and Hopmann (2012) addressed two research questions: 1. to what extent is climate change coverage linked to activities taking place within domestic political institutions? And 2. to what extent is the climate change frame challenged in news coverage?, defining the following hypotheses:

Hypothesis 1: News coverage of climate change is linked to activities taking place within domestic political institutions.

Hypothesis 2: News coverage of climate change is dominated by domestic official sources.

Hypothesis 3: The climate change frame is present in both American and Swedish news coverage.

Hypothesis 4: Climate change counter-frames – the focus lies on the “scientific-uncertainty frame” and the “economic consequences frame” – are more prominent in American than in Swedish news coverage (p. 181).

The extensive content analysis of the four papers related to news stories published between the Kyoto (December 1, 1997) and Bali (December 31, 2007) climate change summits using the search strings “Kyoto”, “climate change” and “global warming” was based on *Lexis Nexis* for the American articles, while for the Swedish newspapers the databases *Presstext* and *Mediearkivet* were searched for “Kyoto” or “klimatför” or “växthuseffekt” or “växthusgas” (Shehata and Hopmann 2012, p. 182). Editorials, opinion pieces and stories only mentioning climate change in passing were therefore excluded. The result produced 934 articles in American papers (473 from the *New York Times* and 461 from the *Washington Post*) and 847 articles in Swedish papers (489 stories from *Dagens Nyheter* and 358 from *Svenska Dagbladet*) (Shehata and Hopmann 2012, p. 182).

In order to investigate the general focus of American and Swedish climate change coverage, each article was first coded according to its triggering event to identify the extent to which news coverage was driven by or connected to activities or events taking place in domestic political institutions, at international summits, within the science community or among other non-governmental organisations (Shehata and Hopmann 2012, p. 182). Second, they coded each Kyoto and Bali climate change summit story per paragraph to capture the relative prominence of various sources and frames in the news (p. 183). Sources and frames were coded

on a presence/absence basis for each paragraph of the news stories (Shehata and Hopmann 2012, p. 183).

These findings show that the senders of climate change frames are often domestic officials (approximately 37 per cent) in the United States – 30 per cent were directly linked to activities originating from the White House or controlled by members of Congress –, while in Sweden only 16.5 per cent of stories were initiated by these actors – only 8.5 per cent of the Swedish articles are set by the Swedish government or by members of the Riksdagen, the Swedish parliament (Shehata and Hopmann 2012, p. 184). Approximately 40 per cent Swedish climate change coverage was framed as activities taking place abroad, but only 22.5 per cent of the US coverage was so framed (Shehata and Hopmann 2012, p. 184). This finding makes it clear that the first hypothesis is supported more clearly with respect to American than to Swedish news coverage (Shehata and Hopmann 2012, p. 185).

Shehata and Hopmann's (2012) results related to news coverage of the Kyoto and Bali summits show that 22 per cent of all paragraphs in *New York Times* and *Washington Post* about the Kyoto summit included statements by or quotes from officials working for the Clinton administration, but only about 6 per cent of the Swedish paragraphs covering this period include statements by or quotes from Swedish government sources; Swedish coverage relies mainly on sources from abroad: foreign governments (including the United States), the European Union as well as United Nations and IPCC actors (p. 185). This supports the second hypothesis (Shehata and Hopmann 2012, p. 186).

The third hypothesis predicted that climate change frames are present in both American and Swedish news coverage, which was the case: "The climate change frame is present in between 50 and 79 percent of the paragraphs" (Shehata and Hopmann 2012, p. 186).

Shehata's and Hopmann's (2012) hypothesis 4 states that the two counter-frames – "scientific-uncertainty frame" and "economic-consequences frame" – are more prominent in the American than in the Swedish newspapers which is only partially supported by the data: on the one hand, the total absence of the "scientific-uncertainty frame" in the United States is surprising due to past research on climate change coverage in the United States (p. 187). According to the findings of Shehata's and Hopmann's (2012) study, the climate change frame strongly dominates American news coverage of global warming and leaves no room for climate sceptics questioning the validity of the IPCC's view (p. 188). On the other hand, the "economic consequences frame" was very prominent in American news coverage of the Kyoto summit (it appears in 21.1 per cent of the paragraphs), but disappeared almost completely in 2007 during the Bali summit (it was present in just 0.5 per cent of the paragraphs),

a phenomena which could also be seen in the Swedish newspapers (Kyoto: 7.4 per cent of the paragraphs to 4.3 per cent during the Bali summit) (Shehata and Hopmann 2012, p. 187).

Shehata's and Hopmann's (2012) research is of value because it not only identifies frames, but also addresses a central research question about domestic political factors which influence how climate change is reported by national news media organisations. The results show that not only politics, in general, play a central role in the climate change discussion, but that it is the national government that is directly involved in climate change activities (US: 37 per cent of climate change stories/30 per cent of which showed the involvement of the White House, Sweden: 16.5 per cent of climate change stories/8.5 per cent controlled by the Swedish government). Identified actors are the national government, foreign governments as well as international actors, such as the EU and the IPCC.

2.4. Classifying climate change frames

This literature review results in a list of 11 frame sub-dimensions. In Table 1, the first column "Frame from the discussed literature" records the frames the authors of the reviewed literature (see third column) use in their research. The second column "Frame sub-dimensions from the discussed literature" contains the sub-dimensions the authors of the research identified or defined for their analysis.

In the fourth column, all frames from the literature discussed (see first column) are set in the context of Entman's (1993) definition. For example, "Climate change uncertainty", "Frame of certainty", and "climate change frame, scientific-uncertainty frame" refers – in Entman's (1993) sense – to the frame element "problem definition" of the climate change issue. They define whether climate change is a problem or not. Identified manifestations such as those can be summarised in one or more sub-dimension of "problem definition". Looking further at Entman's (1993) "problem definition", the literature examined provided the following elements: "Climate change is anthropogenic/is not anthropogenic", "Ranges of projections, the presence of sceptical voices or duelling experts", "Valid/uncertain/controversial science, ambitious cause or effects", and "human-induced global warming is a direct cause of climate change, resulting in dramatic consequences".

Coming from different authors, these elements of a climate change problem definition seem a bit inconsistent. To make them more uniform, they are redefined. The result is that Entman's (1993) "problem definition" frame dimension included five frame sub-dimensions, i. e. "Climate change exists and is a problem", "Climate change does not exist", "Climate

change is a subject of controversial debate”, “Climate change exists, but is not a problem”, “Climate change is not fully examined”.

This way, all the results from the literature are set in relation to Entman’s (1993) definition of framing including “problem definition”, “causal interpretation”, “moral evaluation”, and/or “treatment recommendation”. Because the results from the literature show that there are two different kinds of “causal interpretations” – one which prefers to refer to the causes, while the other refers to the effects of climate change – this aspect of Entman (1993) is divided into two: “causal interpretation (causes of climate change)” and “causal interpretation (effects of climate change)”. This differentiation is meaningful, because it differentiates between the origin of climate change and its consequences. The second meaningful change concerns Entman’s (1993) “moral evaluation”: The literature review shows that the moral aspect of climate change is connected with responsibility for the issue (see, for example, Arlt and Wolling 2012, Olausson 2009). Therefore, the term “responsibility” is more appropriate for the issue of climate change than Entman’s (1993) term “moral evaluation”.

Table 1: Clustering of frame sub-dimensions

Frame from the literature discussed	Frame sub-dimension from the discussed literature	Authors	Refers to Entman’s (1993) frame element	Is used as the following frame sub-dimension for this research
Climate change certainty/uncertainty	Climate change is anthropogenic/is not anthropogenic Ranges of projections, the presence of sceptical voices or conflicting experts Valid/uncertain/controversial science, ambitious cause or effects human-induced global warming is a direct cause of climate change, resulting in dramatic consequences the climate change frame is present, but there is room for climate-change sceptics	Arlt and Wolling (2012), McGaurr et al. (2013) Antilla (2005) Olausson (2009) Shehata and Hopmann (2012)	Problem definition	Climate change exists and is a problem. Climate change does not exist. Climate change is a subject of controversial debate. Climate change exists but is not a problem. Climate change is not fully examined.

Frame from the literature discussed	Frame sub-dimension from the discussed literature	Authors	Refers to Entman's (1993) frame element	Is used as the following frame sub-dimension for this research
Cause of climate change	greenhouse gases, car/vehicle/automobile, fossil fuels, extreme weather, floods, forest fires, hurricane/storm	Good (2008)	Causal interpretation (causes of climate change)	Emission of greenhouse gases Natural causes, Destruction of forests
Disaster/implicit risk, explicit risks	Sea-level rise, more floods, water or food shortage, population displacements (Betting that) something adverse happens, insurance issues, precautionary issues	McGaurr et al. (2013)	Causal interpretations (effects of climate change)	Effects on nature: sea-level rise Effects on nature: results of warming, such as floods, drought etc. Effects on humans: water/food supply Effects on humans: climate change refugees/suffering of the poor
economic consequences frame	Negative consequences for the economy result from climate change	Olausson (2012)	Causal interpretations (effects of climate change)	Effects on the economy: huge negative effects if we do nothing, less negative effects if we combat climate change. Effects on the economy: economic problems including costs.
Responsibility	Industrial countries are responsible (historic perspective), populous emerging countries (China, India, Brazil) are responsible	Arlt and Wolling (2012) Olausson (2009)	Responsibility	Developed countries are responsible. Everybody is responsible.
Efficiency of measure to tackle the causes and effects of climate change, opportunity	Mitigation, such as preventing greenhouse gas emissions, adaptation, such as the protection of coastlines as well as the conservation of forestry Opportunities to reduce the risks from greenhouse gas emissions, Opportunities accruing from climate change	Arlt and Wolling (2012) McGaurr et al. (2013)	Treatment recommendation	General reduction of greenhouse gases – national focus, General reduction of greenhouse gases – international focus, Take measures to mitigate the effects of climate change.
Collective action frame of adaptation	Recent dramatic weather situations have to be avoided	Olausson (2009)		Something must be done, in general.

Frame from the literature discussed	Frame sub-dimension from the discussed literature	Authors	Refers to Entman's (1993) frame element	Is used as the following frame sub-dimension for this research
Solutions	energy conservation alternative energy renewable energy	Good (2008)	Treatment recommendation	Reduction of using fossil fuels Use of renewable energy.
Collective action frame of mitigation	reflects the policy agenda, refers to international political events, for example G8 summits, the Kyoto treaty, emission policies and so on, mitigation is framed as a transnational concern; industrialised countries are responsible	Olausson (2009)	Treatment recommendation	Demand climate change policy – national, Demand climate change policy – international.
Collective action frame of adaptation	recent dramatic weather situations must be fought	Olausson (2009)	Treatment recommendation	Something must be done, in general.

Table 2 provides a summary of all the sub-dimensions which were deduced for this research on German and Australian climate change coverage. In the first column, it lists Entman's (1993) defined frame elements, extended for this research on German and Australian climate change coverage as explained in the previous paragraphs. And, in the second column, it summarises all the frame sub-dimensions developed in Table 1/fifth column to provide a better overview.

Table 2: Results from the literature review – frame sub-dimensions for this research

Frame elements based on Entman (1993)	Frame sub-dimension for this research
Problem definition	<ul style="list-style-type: none"> - Climate change exists and is a problem. - Climate change does not exist. - Climate change is a subject of controversial debate. - Climate change exists but is not a problem. - Climate change is not fully examined.
Causal interpretation (causes of climate change)	<ul style="list-style-type: none"> - Natural causes - Destruction of forests - Emission of greenhouse gases

Frame elements based on Entman (1993)	Frame sub-dimension for this research
Causal interpretations (effects of climate change)	<ul style="list-style-type: none"> - Effects on nature: sea-level rise - Effects on nature: results of warming, such as floods, drought etc. - Effects on humans: water/food supply - Effects on humans: climate change refugees/suffering of the poor - Effects on the economy: huge negative effects if we do nothing, less negative effects if we combat climate change - Effects on the economy: economic problems including costs
Responsibility	<ul style="list-style-type: none"> - Everybody is responsible - Developed countries are responsible
Treatment recommendation	<ul style="list-style-type: none"> - Something must be done, in general - General reduction of greenhouse gases – national focus - General reduction of greenhouse gases – international focus - Reduction of using fossil fuels - Use of renewable energy - Demand climate change policy – national - Demand climate change policy – international - Take measures to mitigate the effects of climate change

What is more, Wolling and Arlt (2012), Good (2008) and Sheheta and Hopmann (2012), who analysed the social context of frames, provide a list of relevant senders of climate change frames: national government/politicians, scientists, economists and international actors (for example, EU, IPCC).

2.5. Summary: framing of climate change

Chapter 2 provides an overview of framing by examining the process of framing, by looking at the different approaches to gathering frames, and by giving an impression of the framing of climate change through media coverage. All these aspects identify the methodical framework for this research on German and Australian climate change coverage.

In reference to the process of framing, this research involved Scheufele's (1999) "frame building" and it examines the salience of climate change issues in German and Australian quality newspapers. Besides, this research considers the actors involved in climate change reporting. Looking at the studies in this chapter, national government/politicians, scientists, economists and international actors (for example, EU, IPCC) are the most considered actors in climate change coverage. Moreover, the role of journalists is of special interest. Articles which are written exclusively from journalists, i. e. those that do not include any additional

quotations by scientists, experts, politicians, and so on, could reveal the influence of journalists in the process of framing. However, in this research, the actors representing the identified frame sub-dimensions are coded separately from the frame sub-dimensions.

Arlt's and Wolling's (2012) content analysis provided a good overview of the state of the German climate change discussion. When it comes to the framing of climate change in media coverage by quality newspapers, the central finding for Germany is that the coverage does not address concrete measures designed to tackle climate change, but refers to climate change as a problem. In addition, results just refer to the context of a climate change conference and, thus, concentrate on an exceptional situation in which climate change is likely to be a major topic in the media.

For Australia, McGaurr et al. (2013) also identified the contrast between a high occurrence of the "uncertainty frame", which is in strong contrast to a high number of "disaster/implicit risk" and "explicit risk" frames. This is an important finding. Although, the research strategy adopted by McGaurr et al. (2013) was only a deductive one, it is of interest for this research whether the "uncertainty frame" appears as often when concentrating on special events, such as a political change or a flood.

Considering all articles about framing, the most important findings for this research are: 1. Media mostly claim that climate change exists and is a problem (see Arlt and Wolling 2012, Olausson 2009, Shehata and Hopmann 2012). This finding is of interest for this research because it shows that there is a consensus about the existence of climate change even if the political influence on this issue is different in the countries examined. 2. The responsibility for tackling climate change/global warming is delegated to the industrialised countries (see Arlt and Wolling 2012, Olausson 2009), and 3. Politicians play a central role in the climate change discussion (see Shehata and Hopmann 2012). Politicians even prevent society from taking action to reduce greenhouse gas emissions, because policy makers separate the action society needs to tackle climate change and the action required to reduce greenhouse gas emissions (see Olausson 2009).

The findings in this literature review on framing result in 24 frame sub-dimensions (see Table 13), which can be associated with Entman's (1993) frame elements, whether it is a "problem definition", "causal interpretation (divided into causes and effects for this research)", "moral evaluation (renamed: "responsibility" for this research)" and/or a "treatment recommendation". The frame sub-dimensions which are identified through the literature review on framing (see Chapters 2) are extended inductively, analysing a test sample of articles.

As it is of major interest in the context of “frame building”, this research also lists the actors mentioning the climate change frame sub-dimensions. In this context, it has to be considered that some actors communicating climate change messages remain unknown because they are not mentioned in the media. One reason for this aspect might be that journalists are audiences of other news media and that they are creating new media content based on their own cognitive processing (see, for example, Scheufele 1999, Bach et al. 2012).

3. Theory: The Extended Sphere Model of Bräuer and Wolling (2014)

As the framing literature does not provide the necessary tools to explain the differences in the coverage, e.g. the influence of the journalists' work in the context of climate change coverage, a second theoretical tool has to be introduced. Therefore, chapter 3 covers the relevant literature using the "Extended Sphere Model" of Bräuer and Wolling (2014) as a guideline.

The "Extended Sphere Model" of Bräuer and Wolling (2014) examines the influences on media – in this case climate change coverage – from six perspectives. This thorough study of climate change coverage during the research period (years 2007-2011) gives a broad insight on the media landscape, the work of journalists as well as the public opinion on climate change at that timeperiod and, consequently on "frame building" (Scheufele 1999) – so, aspects which influence the framing of journalists (Hänggli 2011, p. 1). The results of this broad overview on climate change related factors based on the six spheres of Bräuer and Wolling (2014) are used to identify hypotheses as well as sub research questions for this research.

In chapter 7, research activities published after the year 2011 are introduced to provide insights in the development of climate change coverage after the research period of this work. The results of this work on climate change coverage are also compared with the findings of this work. This additional view on more current research in terms of climate change coverage helps to classify the results of this work and to identify recommendations for further research.

For understanding the "Extended Sphere Model" of Bräuer and Wolling (2014), first, the underlying model of Donsbach (1987) is briefly introduced. Donsbach (1987) distinguishes the subject sphere, the institutional sphere, the professional sphere and the societal sphere, four spheres that should describe how media content is influenced (p. 112). The subject sphere refers to the journalist as an individual referring to his/her values, attitude and job motivation; the institutional sphere looks at the media companies as the environment in which the journalist has to act; the professional sphere is about the journalist as part of a social group, so the profession "journalist", and examines, for example, ethical issues, education and information procurement; and the societal sphere includes aspects which refer, for example, to political or legal parameters (Donsbach 1987, pp. 111 ff.).

In this work, the subject sphere addresses individual key issues of a journalist, such as political attitudes, topic selection and topic design (news bias, instrumental actualisation). The

institutional sphere is about influences within a media organisation, such as organisational structure, ownership and editorial goals. The professional sphere pays attention to journalistic routines, such as different prioritisation of news values and quality indicators. And the societal sphere refers to cultural values as well as institutional parameters of the political and media system, such as the press law.

Bräuer and Wolling (2014) expanded Donsbach's "Four Sphere Model" by adding the "Public sphere" [Öffentlichkeitssphäre] and the "Sphere of structural conditions" [Sphäre der materiellen Rahmenbedingungen], which are important spheres for this research.

The "Public sphere" is concerned with public opinion on a topic as well as with strategic communication activities (Bräuer and Wolling 2014, p. 241). It is a significant sphere for this research because this research analyses the role of climate change before and after an election campaign and, thus, the strategic political information the public is confronted with. Thus, aspects such as the influence of political communication on the public in the context of climate change as well as whether climate change is taken up as an issue within an election campaign are part of this sphere. The "Sphere of structural conditions" refers among other things to natural conditions and current events which influence media coverage (Bräuer and Wolling 2014, p. 241). Because this research examines and compares the coverage before and after an environmental disaster as well as before and after an election, this sphere is a major foundation for this analysis. It clarifies whether there is a connection between an environmental disaster and climate change as well as between an election and climate change in the media. The six spheres of Bräuer and Wolling's (2014) "Extended Sphere Model" are explained in the context of climate change coverage reviewed in this research in Figure 2.

Using these six spheres and their definitions, the first part of this chapter introduces studies related to climate change coverage in Germany and Australia from 2007 to 2011. This review is mainly descriptive and does not attempt to explain differences and similarities in climate change coverage. It does, however, identify the different approaches to climate change coverage in the two countries. Therefore, the structure of this chapter is not organised around the six spheres, but introduce different theme groups, for example, political issues in terms of climate change or journalistic practices which are then – when summarizing the topic – referred to one of the six spheres of Bräuer and Wolling (2014).

The second part of this chapter studies external influences on journalistic work. This includes rules such as news values, "...which provide yardsticks of newsworthiness and constitute an audience-oriented routine" (Shoemaker and Reese 1996, p. 106), as well as regulations relating to the interests of media owners, who "...intervene to keep content within appropriate

bounds, and they can override normal professionalism and routines” (Shoemaker and Reese 1996, p. 250). Other factors of influence, which are not part of the newsroom, are, for example, political actors, the public and lobby groups. The influence of politicians and lobby groups on the climate change debate is examined in detail. The chapter also briefly reviews public opinion about climate change; briefly, because this research does not examine the opinion of those affected by climate change. Finally, this second part examines environmental influences such as energy supply, natural resources and the climate conditions of Germany and Australia to get an impression of the relationship between the environment and the economy as well as the current state of climate challenges.

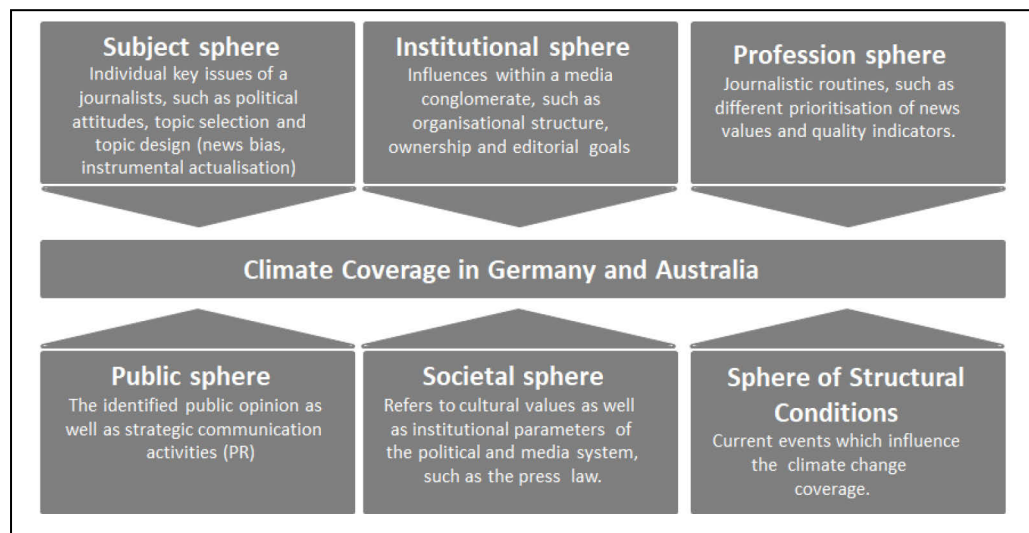


Figure 2: *Independent variables influencing climate coverage in Germany and Australia*

Source: Bräuer and Wolling 2014, own explanations

The third part of this chapter examines how journalists’ work is influenced from inside the media company. So, it introduces aspects that are imposed by media owners and companies on the work in their newsrooms.

At the heart of climate change coverage, there is the journalist with his/her professional practice. The fourth part of this chapter, therefore, takes a closer look at the journalistic profession in Germany and Australia. Shoemaker and Reese (1996) call this professional practice “routines” (p. 15) and say that “...these include such things as gatekeeping, the beat system, balancing sides in issue stories, and reliance on authoritative sources” (p. 15). It examines the journalists’ attitude to work in both countries and the socialisation of journalists.

The fifth part of this chapter introduces the four newspapers used in this investigation, looking at their ownership, their political position and their coverage.

With this broad survey on the different influencing factors on climate change coverage in Germany and Australia, the “Six Sphere Model” of Bräuer and Wolling (2014) is used, on the one hand, to identify hypotheses as well as sub research questions and, on the other hand, to contextualize the framing research explained in the last chapter. To understand how the “Six Sphere Model” works together with framing, Figure 3 explains the connection between the two theoretical approaches:

In the centre of climate change coverage are the journalists who write the articles. The journalists get aware of the issue – in this case, the issue of climate change in the context of an environmental disaster or an election. While writing the article about the issue, the journalist is influenced by factors from the six spheres. For example, the institutional sphere predetermines the political orientation of the article. So, the six spheres affect the focus of an articles and, thus, also how climate change is framed.

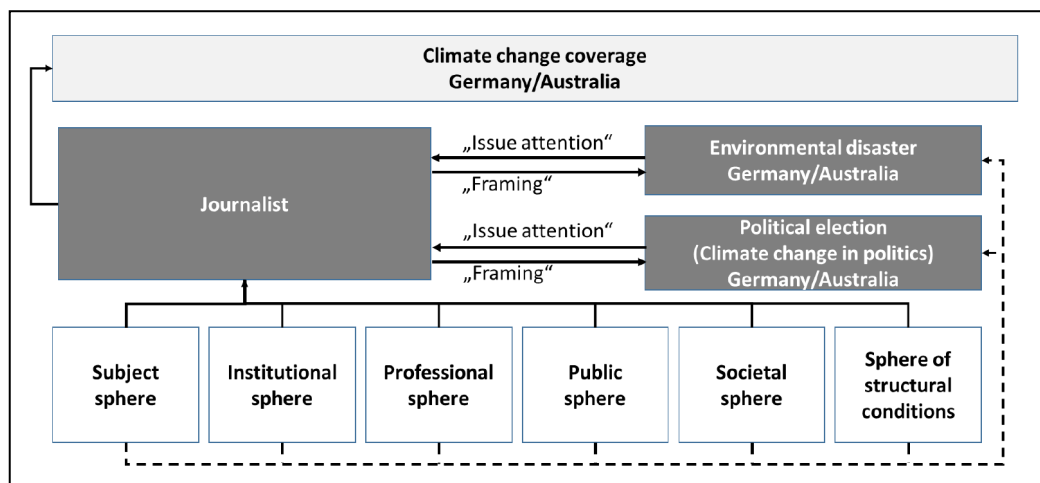


Figure 3: How the “Six Sphere Model” of Bräuer and Wolling (2014) and framing interacts

Source: own figure

3.1. German and Australian climate change coverage from 2007 to 2011

The starting point for this research, 2007, was the year in which “Klimakatastrophe [climate catastrophe]” became the word of the year in Germany (GfdS 2016). It was the year in which Al Gore – together with Davis Guggenheim – was awarded an Oscar® for the documentary “An Inconvenient Truth” (Academy Awards 2007). There was the UN Climate Change Conference in Bali, at which the operational details of the Kyoto Protocol Adaptation Fund as well as a road map for negotiations on strengthening the UN climate change regime were finalised (Müller 2008). It was the year after Sir Nicolas Stern, a British economist and Professor at London School of Economics, had published his “Stern Review on the Economic of Climate Change” which had considerable impact on public debate about climate change policy in Australia (see, for example, Quiggin 2007, Jotzo 2007, Henderson 2009). And, in Australia’s 2007 election campaign, after 14 years without a vote on the topic, climate change was the defining issue in the political campaign of Labor candidate Kevin Rudd (see, for example, Gascoigne 2008, Bongiorno 2008). So, in Germany as well as in Australia, climate change was a central topic on the political and social agenda. But did these discussions and events influence newspapers’ climate change coverage? And if so, *how* did they influence news coverage of climate change?

To answer these questions, this chapter reviews research carried out between 2007 and 2011, the period on which this research concentrates its analysis. It therefore examines the cultural values of the media system and, thus, identifies aspects of the Societal sphere (Bräuer and Wolling 2014).

Schäfer et al. (2012) offer a starting point with their comparison of media attention to climate change in 27 countries, including *Germany and Australia*. The authors examined leading media from 1996 to 2010 (Schäfer et al. 2012, p. 10). For Germany, they used *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung*, both newspapers are also part of this research, and *The Australian* as well as *The Sydney Morning Herald* for Australia (Schäfer et al. 2012, p. 12). The latter newspaper is also examined in this research.

For their full text search in electronic databases, the authors use the term “climate”, which has to appear in connection with a word indicating change, such as “change”, “development”, “warming”, “cooling”, as well as synonyms such as “greenhouse effect” or “global warming” when global change in temperatures is discussed (Schäfer et al. 2012, p. 11). Schäfer et al. (2012), moreover, focus on coverage including extreme weather events, changes in temperature, events at the international level, such as climate change conferences, as well as political activities (pp. 15 f.). Concentrating on the two countries which are of

importance for this research, Schäfer et al. (2012) found 13,298 articles in German newspapers and 23,440 articles in Australian ones, from 01/1996 to 06/2010 (p. 12). This initial comparison reveals that greater media attention was paid to climate change in Australia than in Germany.

Further findings by Schäfer et al. (2012) show that media attention in both countries peaked around specific events, such as climate change conferences, "...probably because of the high stakes and the prominent political actors involved...", and especially around the 2009 Climate Summit in Copenhagen (COP 15) (p. 20) as well as that extreme weather events do not result in a peak of media attention (Schäfer et al. 2012, p. 25). Moreover, the authors found out that the national government has strong effects on media attention on climate change in Australia and considerable influence in Germany (Schäfer et al. 2012, p. 25). Domestic political activities are strong predictors of media attention in both countries, in Australia "...the Stern Review – dealing with the economics of climate change – results in a significant amount of media attention" (Schäfer et al. 2012, p. 27).

For Australia, the findings show that, in addition, the increase in climate change coverage was very strong in the second half of the 2000s, which is a central period for this research (Schäfer et al. 2012, p. 20). From 2006 to 2009, 3.61 per cent of all coverage in the Australian newspapers that were analysed was about climate change, while in Germany there was only 0.90 per cent climate change coverage in the same period (Schäfer et al. 2012, p. 21).

In addition, Schäfer et al. (2012) characterise Australia's climate change coverage as 'hot' and controversial as well as extreme politicised, while in Germany the topic was already established as a serious problem in the media as well as in politics, which resulted in limited controversy (p. 23).

Concentrating on German climate change coverage, Maurer (2011) discussed how journalists deal with uncertainty (p. 61). He explains that in its regulations, the *Deutscher Presserat* instructs journalists to identify insecurity (Maurer 2011, p. 61); studies, however, show that insecurity was not generally conveyed in the media (Maurer 2011, pp. 62 f.). Maurer (2011), however, stated that climate change was one of the events that conveys a sense of insecurity, an aspect that was particularly prominent during the discussions about future temperature increases in the 1990s (p. 64).

Maurer (2011) explored how the media dealt with feelings of insecurity about global climate change and how the coverage changed, using content analysis which examines the coverage of the world climate change conferences in the German *Frankfurter Allgemeine Zeitung*, *Bild-Zeitung* and *Der Spiegel* from 1979 to 2007 (p. 65). These media were chosen because

they represent different qualities of climate change coverage (Maurer 2011, p. 65). Maurer (2011) argues that existing content analysis shows a high degree of consonance in climate change coverage and he wanted to find out whether this was also the case with these very different media. For him, a consonance between these three media might be an indication for a similar climate change coverage in all German print media (p. 65).

The focus of Maurer's (2011) research was on the reporting about prognoses of temperature increases as well as the consequences of climate change (p. 66). He coded the central topic, the actors, how climate change was described as well as the responsibility for causes and solutions in terms of climate change (Maurer 2011, p. 66). The coverage was coded on a five-tier scale from "very insecure" to "very secure" (Maurer 2011, p. 66).

Maurer's (2011) results show that, in the mid-1990s, the coverage of the world climate change conferences became increasingly important, decreased during the 2000s, and came back on the agenda in 2007, so was always in the media when a world climate report was published (p. 67). All the print media examined represented climate change as negative (97 per cent), threatening (93 per cent), man-made (93 per cent) and extraordinary (87 per cent) (Maurer 2011, p. 67). Surprisingly, the number of scientists as actors related to climate change in the basic media was higher in times without a world climate change conference than during such events (Maurer 2011, p. 67).

Insecurity in terms of temperature increases was emphasised using temperature spans (in 40 per cent of all coverage) or by not mentioning a minimum level (Maurer 2011, p. 68). A noteworthy result of Maurer (2011) is that the greater the scientific insecurity in the prognoses of the IPCC, the lower the communication of insecurity in the media (p. 68). In addition, Maurer (2011) identified the fact that 638 out of 810 articles refer to the consequences of climate change, less than 2 per cent of them include positive aspects; insecurities about the consequences were rarely communicated (p. 69). This result goes along with the researches of Good (2008), McGaurr et al. (2013) and Olausson (2012) (see Chapter 2) who identified frames of causes and effects of climate change and did not find any frame with a positive connotation.

Looking at *Australia*, Manne (2011) analysed news stories and opinion columns about climate issues published in the newspaper *The Australian* during the period January 2004 to April 2011 (p. 50). He wanted to find out how many articles published during this period claimed that climate change was a reality and how many denied it (Manne 2011, p. 50).

For his content analysis, Manne (2011) examined all articles in the defined research period that included the search term "climate change" (p. 50). Editorials were extracted for separate

analysis and letters to the editor were excluded, because they represent the opinions of readers rather than editorial views (Manne 2011, p. 50).

Manne (2011) found three ways in which climate change was represented in the news media: the first sample was formed by news items and opinion columns written in support of 1. the consensual core of climate change science, 2. the findings of the IPCC, 3. the Kyoto Protocol and Australia's ratification of it, 4. an Australian response at least as "radical" as the Energy Trading Scheme mooted by the Howard government in 2007 and the Rudd government between 2008 and April 2010 (p. 50). This category Manne (2011) called "favourable to climate change action" (p. 50).

A second sample was formed by news items and opinion columns that opposed 1. the consensual core of climate science, 2. the findings of the IPCC, 3. the Kyoto Protocol or Australia's adherence to it, 4. to an Australian response at least as 'radical' as the Energy Trading Scheme prefigured or proposed by the Howard and Rudd governments between 2007 and early 2010 (Manne 2011, p. 50). This category was called "unfavourable to climate change action" (Manne 2011, p. 50).

A third category was formed by all climate change-related news items or opinion columns that were concerned with other matters or were simply neutral (Manne 2011, pp. 50 f.).

The result was clear: After the third category was excluded, he "...found that, of the total 880 items in the sample, only 180 accepted the scientific consensus and the need for action on climate change while 700 rejected them" (Manne 2011, p. 51). This result shows that *The Australian* supported a climate-change-sceptical position. This finding is supported by McGuarr et al. (2013) who also identified climate sceptic frames in Australian newspapers (see Chapter 2). This tendency, of course, cannot be generalised for all Australian newspapers. In this context, it is important to know that the newspaper *The Australian* is owned by Rupert Murdoch's News Corp., which – as Bacon (2013) represents in the following – is generally more climate-change-sceptical than the two newspapers which were analysed in this research. Therefore, it would have been of interest to know the amount of climate change coverage by Manne's (2011) third category and how these articles described climate change.

The discussion of climate-change-sceptical viewpoints is extended by Bacon (2013) who also used a content analysis. She looked at the coverage of climate science in ten Australian newspapers between February and April 2011 and 2012: *The Australian*, *The Age*, *The Sydney Morning Herald*, *The Daily Telegraph*, *Herald Sun*, *The Advertiser*, *The Courier Mail*, *The Northern Territory News*, *The Mercury* and *The West Australian* (Bacon 2013, Chapter 4.1). Bacon (2013) retrieved and analyzed all articles which mentioned climate science and

related findings from the *Dow Jones Factiva* database. . Those items that only included incidental mentions of climate change policy such as articles that only included references to the ‘Minister for Climate Change’ were not included and if ‘climate change’ merely appeared in a list of items in a story on a different topic, the article was excluded as well (2013, Chapter 4.1). The result was a sample of 602 articles (Bacon 2013, Chapter 4.2).

A general finding by Bacon (2013) is that the number of articles accepting climate change as a fact dropped from 70 per cent in 2011 to 60 per cent in 2012 across the sample of articles, while, on the other hand, the number of articles rejecting the consensus grew from 8 per cent in 2011 to 14 per cent in 2012 (Chapter 4.6).

In addition, Bacon (2013) found that 65 per cent of articles were produced in a way which communicated acceptance of the climate change consensus position to the readers. However, for Bacon (2013) “this underrepresents the agreement amongst more than 97% of scientists that human activity is a causal factor in climate change” (Chapter 4.6). 11 per cent of all examined articles rejected anthropogenic climate change, further 21 per cent suggests doubt about it: “In another words, 32% or nearly one-third of all articles either rejected or suggested doubt about the consensus position” (Bacon 2013, Chapter 4.6).

Bacon (2013), in addition, identified that only 10 per cent of articles in Fairfax Media either rejected or suggested doubt about climate change whereas 41 per cent of News Corp. articles do so (Chapter 4.6). This result is consistent with Manne’s (2011) examination of the News Corp. newspaper *The Australian*. And it also supports the assumption that not all newspapers in Australia mainly rejected climate change.

This way of reporting the climate change as well as the climate sceptic position likewise represents the journalism practice of so-called balanced news reporting (see Boykoff and Boykoff 2004); however, it does not portray the scientific consensus. In the case of climate change, it often presents “balance as bias” (see Boykoff and Boykoff 2004). So, there might well be a tendency towards balance-as-bias reporting in Australian climate change coverage.

Comparing the discussed climate change coverage in the two countries, there are a number of similarities: climate change conferences and related events led to climate change coverage skyrocketing, whereas extreme weather events did not have any influence on the amount of climate change coverage in either country from 2007 to 2011. In both countries, there was, in addition, a perceivable increase in climate change coverage in the second half of the 2000s, even though the increase in Germany was not as large as in Australia.

Besides all these similarities, there are also a number of differences which could influence climate change coverage in Germany and Australia. One aspect is the powerful influence of government in Australia whereas Germany's national parliament only has considerable influence on media attention for climate change (see Schäfer et al. 2012). In addition, extreme weather events did not appear to have an effect on climate change coverage in the research period (see Manne 2011). Australia, moreover, tends to feature balance-as-bias reporting (see Bacon 2013), whereas in Germany the coverage mainly identifies human beings (see Maurer 2011) as the cause of climate change.

A critical perspective on all these studies on climate change coverage in Germany and Australia reveals some clear deficiencies. First, studies on the amount of the coverage (Schäfer et al. 2012) offer a useful comparison between countries; however, due to their size, they cannot go into detail. They remain very abstract. Second, the statement that an environmental disaster, such as an extreme weather event, does not influence climate change coverage refers to the number of articles but does not look at qualitative aspects, so, the way in which the topic is covered (see Schäfer et al. 2012, Maurer 2011).

This research closes these methodical and knowledge deficits. The methodology of framing, which is different from the content analyses in the literature discussed, allows a differentiated examination of the climate change coverage between 2007 and 2011 (see, for example, Rössler 2005, p. 230, Van Gorp 2007, p. 70). Thus, this research can investigate the specifics of German and Australian climate change coverage. It is able to demonstrate the way in which an environmental disaster – in this case a flood – is represented in the climate change coverage and further examine the role of climate change in the context of an election campaign.

Table 3 summarises all the findings of the literature review of German and Australian climate change coverage.

Table 3: Societal sphere: comparison of German and Australian climate change coverage

Aspect of climate change coverage	Germany	Australia
Media attention peaks around specific events, such as climate change conferences	Extremely high (Schäfer et al. 2012, Maurer 2011)	Extremely high (Schäfer et al. 2012)

Aspect of climate change coverage	Germany	Australia
The influence of extreme weather events on the amount of climate change coverage	Extremely low (Schäfer et al. 2012)	Extremely low (Schäfer et al. 2012)
The influence of domestic parliamentary activity on media attention given to climate change	Moderate (Schäfer et al. 2012)	High (Schäfer et al. 2012)
Increase in media attention in the second half of the 2000s	Moderate (Schäfer et al. 2012, Maurer 2011)	High (Schäfer et al. 2012)
Climate change is established in the media as a serious problem	High (Schäfer et al. 2012)	Low (controversial discussion) (Schäfer et al. 2012)
Climate change is characterised as politicised	High (Schäfer et al. 2012)	Extremely high (Schäfer et al. 2012)
Climate change is represented as man-made	High (Maurer 2011)	Moderate (pro-climate change versus climate-change-sceptical position) (Manne 2011, Bacon 2013)

3.2. External influences on journalistic work in Germany and Australia

The representation of climate change issues depends on various authorities that influence the work of journalists and, thus, their coverage. These authorities might, for example, affect the amount of pro-climate change views as well as climate-change-sceptical positions. Because political influence plays a major role in the context of climate change discussions and is, in addition, of importance for this research due to the analysis of climate change coverage around elections, Chapter 3.2.1 focuses on climate change politics.

Chapter 3.2.2 provides a brief overview of public opinion about climate change. Thus, it makes clear in which way climate change is established as a national issue.

Moreover, in Chapter 3.2.3, this research reviews the impact of lobbies on climate change coverage. This aspect is important because there are various economic interests trying to influence the perception of climate change.

Chapter 3.2.4 provides a short introduction to energy supply, natural resources and the climate of Germany and Australia. These three aspects are of interest for this research because they address environmental as well as economic issues in the two countries. They show the current state of environmental issues in the two countries. And they show how environmental and economic interests can collide when climate change is on the agenda.

With the reviews on politics, public opinion, the influence of lobbies, energy supply, natural resources and climate, this chapter explains aspects of the *Public sphere* (public opinion), the *Societal sphere* (control of lobbies) and the *Sphere of structural conditions* (politics, energy supply, natural resources and climate) in terms of the theoretical model of Bräuer and Wolling (2014). Political elites are authorities which are able to initiate events – this could, for example, be the representation of climate change during an election – that influence the discussion on climate change. In addition, new aspects related to energy and natural resources as well as extreme climatic events could do so, as is the case with the environmental disaster that is discussed in this research. The work of lobby groups has impact on the political work of a country. It influences political decision-making essentially and, consequently, the political agenda which is picked up by the media. Finally, the public is able to influence the climate change discussion while an election campaign takes place.

3.2.1. *Political influence on climate change coverage in Germany and Australia*

Politics is one of the authorities with a major stake in the climate change discussion. Attention by politicians, or their ignorance of this issue, influences the amount of climate change coverage in the media (see Gelbspan 2005, Rhomberg, 2012, Giddens 2008). So, Gelbspan (2005) generally states that “...global warming gains news prominence only when it plays a role in the country’s politics” (p. 78). Rhomberg (2012) supports Gelbspan (2005), saying that, for a long time, the climate debate was only part of the scientific system but received media attention after climate change became a political topic (p. 53). Giddens (2008) examines the political task to establish policies and explains that “it is conventional to say of the modern state that it should be an enabling state and this notion certainly applies to the management of climate change policy” (p. 8).

German awareness of environmental topics first emerged in the 1970s. In 1974 the Federal Ministry of Education and Research “...started promoting ... the use of wind energy with the aim of increasing its economic efficiency” (Bechberger and Reiche 2004, p. 27). And the Federal Environment Agency first mentioned the “Klimaauswirkungen von Luftverunreinigungen [Air pollutants and their effects on climate]” officially in its 1978 annual report as well as, in 1979, the consequences of climate change (Weidner 2008, p. 5).

The increasing interest and the need for environmental political strategies resulted in numerous action groups, new environmental protection organisations and, finally, in 1980, in the foundation of the Green party (Kern et al. 2003, p. 8). So, the topic of climate change gathered pace during the 1980s, in Germany. In 1986, the news magazine *Der Spiegel* published an article about the current state of climate sciences and placed a picture of the drowning

cathedral of Cologne on the title page (Tilly 2007, p. 360). In March 1987, Chancellor Helmut Kohl declared that the climate question was the most important environmental issue of all time (Weidner 2008, p. 6). Moreover, in the same year, the Climate Enquete Commission for the “Vorsorge zum Schutz der Erdatmosphäre [Precautions for the protection of the earth’s atmosphere]” was established, which shed light on the German climate debate and had a major influence on all political decision makers (Tilly 2007, p. 361). This commission also studied the consequences of global warming and made a demand for government action on climate change (Tilly 2007, p. 356). In addition, in the late 1980s, all kind of media play a central role in terms of informing about climate change (Weidner 2008, p. 8). Environment as a topic was given a great deal of prominence in the media, in public debate as well as on the political agenda of all parties (Brand 1993, p. 20).

In the early 1990s, the reconstruction of the new eastern states of Germany and their economic stability became first priority (Kern et al. 2003, p. 9). So, Germany created an ambitious climate protection agreement though, the so-called *Agenda 21*, but it did not manage to fulfil all of its requirements (Kern et al. 2003, p. 10). However, some environmental policies were put into practice. The act on supplying electricity from renewables (StrEG), especially for wind energy, was an important instrument for promoting climate change during the 1990s in Germany (Bechberger and Reiche 2004, p. 27). Then there was the low-carbon policy which the main German industrial associations arrange voluntarily with the federal government in exchange for the ecotax, which was established four years later when Chancellor Schröder took office (Weidner 2008, p. 7). One reason for these political activities was surely the fact that the public rejected a slower pace of implementing climate change politics; the climate change issue was by then securely established in the public discourse (Weidner 2008, p. 24 f). The public even accused the government of a lack of climate-related activity and believed that this lack of activity was (partly) responsible for extreme weather as well as floods (Tilly 2007, p. 361).

This reception of the climate change discourse was only possible in Germany because climate sceptics – except in 1995 occasionally, but unsuccessfully – could not get a word in edgeways (Tilly 2007, p. 362). At the end of this decade, in 1997, the *Kyoto Protocol* with compulsory reductions in greenhouse gas emissions for industrial countries was finalised, strongly supported by Angela Merkel who was Secretary of State for the Environment at that time (Weidner 2008, p. 7). One year later, the new government SPD and Bündnis 90/Die Grünen (1998 to 2005) gave climate protection as well as energy politics top priority (Weidner 2008, p. 8). In the next four years, this government implemented a number of political projects relating to energy resources. The two most important were the Renewable

Energy Source Act [Erneuerbare-Energien-Gesetz, EEG] (Kern et al. 2003, pp. 12 f.). Ecology, eco-sensitive behaviour and thinking became mainstream (Brand 1993, p. 20).

In 2000, "...the Renewable Energy Sources Act (Erneuerbare-Energien-Gesetz, EEG)...continuing the approach of its predecessor, the StrEG of 1991, in an extended and in many respects improved manner" (Bechberger and Reiche 2004, p. 30). In 2005, the Kyoto Protocol came into force. Weidner (2008, p. 4) and Bardt (2005, p. 260) are sure: without the huge commitment of Germany over numerous years, this would not have happened. Even under the new CDU/CSU and SPD government, which was elected in 2005, the climate and energy politics went ahead and sources of renewable energy as well as energy conservation activities were expanded (Weidner 2008, p. 10).

During the years which are important for this research – 2007 to 2011 – a clear statement about climate change politics was made in 2009. The new CDU/CSU and FDP government emphasised in its coalition agreement that they wished to support a low-carbon economy and stated that the affiliated technologies, which could be exported, represented an opportunity for the German economy and an opportunity to reduce global greenhouse gas emissions (Neuhoff 2010, p. 134). This is why the new government established high-tech entrepreneur funds (Neuhoff 2010, p. 134). As a pioneer in environmental protection, the coalition agreement, moreover, assumed that Germany could advance growth in decarbonisation within the European Union and throughout the world (Neuhoff 2010, p. 136). With this agenda, the new government extended the work of the former government, which had consisted of the CDU/CSU and SPD (Koalitionsvertrag 2005).

In 2009, the global financial crisis influenced the activities of climate change politics. Climate change became less important in the political debate – despite alarming news from climate scientists (Kuckartz 2011, pp. 130 f.). The financial crises also had a major influence on the United Nations Climate Change Conference in Copenhagen. The expectations were high, but these were not fulfilled. "Weltrettung vertagt! [Salvation of the world adjourned!]" was one headline of *Die Zeit* (2009) after the conference, even though the article said that the two-degree-target was still on the international agenda as well as the fact that the people's behaviour had changed, companies had realised that green engineering is competitive and that more and more cities had joined forces to tackle climate change.

The general *German mindset in relation to climate change* at the beginning of the research period is described by Tilly (2007). He says that to take part in an environmental regime, such as the *Kyoto Protocol*, all states involved have to agree that climate change is anthropogenic, that there is a connection between greenhouse gas emissions and climate change,

that a reduction of greenhouse gas emissions will have an impact on the further development of climate change and that climate change has negative consequences for the environment (p. 357).

Looking at literature that analyses climate change as a concept, in Germany, Tilly (2007) argued, climate change was differently constructed during the years. According to him, until 1986 there was scepticism and resistance, from 1986 to 1992 there was catastrophising, and from 1992 to 1997 climate change was seen as a general political problem (Tilly 2007, p. 360). For Tilly (2007), the second period in particular – with the widespread interpretation of climate change as a catastrophe – was essential for the further perception of climate change: first, because this effect was only found in Germany and, second, because the term “climate catastrophe” created a dynamic which put pressure on politicians (p. 360). Besides, Tilly (2007) shows that the Climate Enquete Commission had the explicit task to create consensus about climate change across all political parties and definitely institutionalised climate change as an issue of concern throughout society (p. 361). After this period, the discourse of “climate catastrophe” was well established in Germany and doubts about climate change and its consequences could no longer influence the public (Tilly 2007, p. 362). For Tilly (2007), the question is, however, why this discourse was so widespread in Germany and he stated that perhaps it was not so much that the Climate Enquete Commission established the consensus, but rather that the Climate Enquete Commission utilised an existing consensus in German society to achieve success (p. 365).

Weidner (2008) extended Tilly’s (2007) notion of “climate catastrophe” when exploring the overall concepts of German climate politics and stated that there are two dominant concepts which influence all climate change actors, the general public as well as the scientific discourse: the concept of “ecological modernisation” and the concept of “sustainable development” (p. 11). Weidner (2008) claims that these concepts are not in competition but are complementary or even congruent concepts (p. 11). According to Weidner (2008), “ecological modernisation” refers to a political system or nation state that endorses environmentally compatible/friendly production as well as a consumer structure (p. 11). This concept should ensure long-term and stable welfare gains in capitalist structures (Weidner 2008, p. 11). The concept of “sustainable development” is more global and more long-term as well as broader in scope, because it refers to global welfare development which will remain important in the remote future; in this concept, ecological aspects are not necessarily prioritised in relation to social and economic aspects (Weidner 2008, p. 12).

After the period which this research covers, the new CDU/CSU and SPD government took office in 2013. In the “Aktionsprogramm Klimaschutz 2020 [Action programme climate

protection 2020]” of the Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit, the new government adopted the goal of the former government to reduce greenhouse gas emissions by 2020 – a 40 per cent reduction in comparison to 1990 was the target (2014, p. 7). This is why activities for industry, agriculture, transport, waste disposal as well as in construction and real estate management were planned. The goal of these activities was to reduce 62 to 78 million tonnes of greenhouse gases by 2020 (BMUB 2014, p. 26). In addition, renewable energy was identified as the main energy source in the future: by 2025, 40 to 45 per cent of the energy in Germany should be produced by renewable energy sources and, by 2035, between 55 and 60 per cent (BMUB 2014, p. 67).

Summarising German climate change politics, Bechberger and Reiche (2004) say that “from an international point of view, Germany can be seen as one of the pioneering countries in the development and application of RES [Renewable Energy Sources]” (p. 26). Weidner (2008) refers to an expected 20 years of positive path dependency by the German government, regardless of the dominant parties and despite socio-ecological changes (pp. 10 f.). Thus, for him “German climate change policy is one of the most ambitious and effective climate protection endeavors worldwide” (Weidner 2008, p. xii).

Like Germany, *Australia* has a long history of climate change discussion. However, the development of the Australian green movement was not as clear-cut as the German one (see, for example, Hamilton 2001 and Taylor 2014).

Its climate change politics started when Robert Hawke was Labor Prime Minister of Australia from the early 1980s to the early 1990s, and Australia “...proved willing to adopt, in principle at least, ambitious targets for reducing emissions” (Hamilton 2001, p. 32). So, Hawke initiated numerous programmes which mainly focused on Australia’s energy system (Hamilton 2001, p. 32). “In October 1990 Australia formally adopted the Toronto targets... of stabilising greenhouse gas emission at 1988 levels by 2000 and reducing them by 20 per cent from that level by 2005” (Taylor 2014, p. 31).

Hawke also made sure that the media supported his programmes: “...Human responsibility for the enhanced ‘greenhouse effect’ was given in every press article reviews as well as in government documents” (Taylor 2014, p. 2) and environmental matters, in general, as well as climate change in particular were treated as ‘mainstream’ and of concern to all citizens (Taylor 2014, p. 62). In addition, scientists were the leaders of this movement which was characterised “...by their effective interaction with media and policymakers as well as the

organisation of conferences and major public events” (Taylor 2014, p. 29). “Equally remarkable is the fact that the science information about causes, effects and risks has remained consistent over nearly three decades” (Taylor 2014, p. 2).

In March 1996, the Howard government took office and, for the national debate about climate change and the leading role of Australia in the global climate change discussion, this was a major setback (see, for example, Crowley 2007, Taylor 2014 and Hamilton 2001). Crowley (2007) explains that Australia’s position on climate change changes “...from aspiring global leader in the 1980s... to a globally isolated laggard a decade later...” (p. 130). Taylor (2014) says that “where once there had been a clear narrative about risk..., Australians were now told not to worry...” (p. xiii). And Hamilton (2001) is sure that “the fact that the Howard Government appointed as the Minister for Resources and Energy a man who rejected greenhouse science, defended the interests of the coal industry at every opportunity...” (p. 74). For more than a decade, the issue climate change was, thus, treated as a burden.

The change came with the election campaign, in 2006/2007 – the campaign which is examined in this research: Climate change was brought back onto the agenda. Labor candidate Kevin Rudd “...did a fine job of scaring voters with dire predictions on the extent of human-induced climate change and the potential damage to Australia” (Suter 2010, p. 268). This election campaign was “... referred to as the world’s ‘first climate change election’” (McDonald 2012, p. 578). And, after Rudd won the election, “the first action of the new Rudd Labor Government was to ratify the Kyoto Protocol – the first time that the first act of an Australian Government was to ratify a treaty” (Suter 2010, p. 268). In addition, Rudd was “...among the most active heads of state at the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in Copenhagen in 2009, at which Australia had one of the largest delegations” (McDonald 2012, p. 579).

Rudd “...was willing to create an innovative way of combating climate change” (Suter 2010, p. 269). He did, however, disappoint his voters: he only managed to introduce “...relatively mainstream political responses, such as a cap-and-trade emissions trading scheme, [which] encountered serious – and ultimately effective – political opposition” (McDonald 2012, p. 589). He called climate change the ‘greatest moral challenge’ – and then failed to push it through; in effect he just walked away from the issue (Suter 2010, p. 310).

Only about three years later, in June 2010, Kevin Rudd was replaced by Julia Gillard, previously the Deputy Prime Minister, in a rapid ‘coup’; Rudd went to the backbenches

(McDougall 2014, p. 290). As a consequence, the controversies within the Labor party escalated so much that they became more interesting for the media than the party's main topic "climate change" (McDougall 2014, p. 290). The new Prime Minister, nevertheless, introduced a carbon tax in response to the issue of global warming; however, she was portrayed as lacking charisma and did not do well in communicating her message (McDougall 2014, p. 290). So, the dynamics in terms of climate change in Australia seemed to disappear as fast as they came.

The *Australian mindset about climate change* during the time of this research was described by Williams and Booth (2013) as not being a pressing political issue in Australian administration during the eleven years of conservative government following Prime Minister John Howard's election in 1996, but it became an issue again when federal politics shifted back towards the left and the Australian Labor Party, led by Kevin Rudd, took office in late 2007 (p. 22). However, Rudd's efforts to act on climate change became increasingly contentious or simply unpopular (Williams and Booth 2013, p. 23). Williams and Booth (2013) state that Kevin Rudd put climate change in a global, universal and threatening context during his election campaign "...but saw the world in overly simplistic terms as divided between two camps" (p. 24). He, thus, created the dichotomy of climate sceptics or climate deniers versus climate change action (Williams and Booth 2013, p. 24). So, in effect, Rudd trivialised the climate change discussion in a political context. And, even though some bills were passed to promote energy efficiency and investment in renewable, there has been resistance in Australia to unilateral acceptance of the need to tackle climate change-related issues (Williams and Booth 2013, p. 23).

The time after the research period is of interest because, in 2013, Rudd was again the candidate for the Labor Party; however, this results in an electoral disaster (McDougall 2014, p. 291). After four years of intra-party chaos, on 7 September 2013, the Labor government was defeated (McDougall 2014, p. 289). With Tony Abbot, Prime Minister from 2013 to 2015, a new era began for climate change in Australia. One of his first political statements about climate science was that anthropogenic climate change was "crap" (Readfearn 2014). And in his political autobiography *Battlelines*, he set out his position in more detail:

"It sounds like common sense to minimise human impact on the environment and to reduce the human contribution to increased atmospheric-gas concentrations. It doesn't make much sense, though, to impose certain and substantial costs on the economy now in order to avoid unknown and perhaps even benign changes in the future" (Readfearn 2014).

McDonald (2012) says about the Australian behaviour in terms of climate change, that “of all states in global politics, there are few that could lay claim to being as inconsistent on global climate change as Australia” (p. 579).

Summarising these findings about the political influence on the German and Australian climate change discussion, it is clear that politics, in general, is able to make – or not make – climate change a national issue and, consequently, has the power to support or disregard the climate change discussion. Looking at the literature examined that was related to the German and Australian climate change discussion, the power of politics in terms of climate change seems to be greater in Australia. The opinion of the Australian Prime Minister and his/her party essentially dominates the debate about climate change (see, for example, Hamilton 2001, Crowley 2007, Taylor 2014). Because climate change was its central issue, it can be assumed that the climate change discussion during the 2007 Australian election was evident in the two Australian newspapers which were analysed in this research.

German political parties, in contrast, do not question the existence of climate change; it seems that it is no longer possible. The German public has accepted climate change as a fact (see, for example, Weidner 2008, Umweltbewusstsein in Deutschland 2014). So, it is difficult for a German political party not to mention this issue as if it wants to be successful in an election campaign. Therefore, it is assumed, that during the German election campaign, there was no big difference before and after the election in media coverage of climate change. Table 4 compares the political influence on the climate change discussion in Germany and Australia.

Table 4: Sphere of structural conditions: political influence on the German and Australian climate change discussion

Century	Germany	Australia
1970s	The German government establishes awareness of climate change	no climate change discussion
1980s	The Green party was founded; Chancellor Helmut Kohl declared climate question to be the most important environmental issue of all time, Climate Enquete Commission was founded	Prime Minister Robert Hawke established ambitious targets for reducing emissions, focusing on the domestic energy system
1990s	Agenda 21 was established; the Kyoto Protocol was finalised	Australia adopted the Toronto targets of a 20 per cent reduction in greenhouse gas emissions; in 1996 John Howard became Prime Minister and the leading role of Australia in the climate change discussion disappeared

Century	Germany	Australia
2000s	the Renewable Energy Sources Act and the Kyoto Protocol came into force; the German government supports a low-carbon economy and affiliated technologies; climate change was described as a catastrophe; the term “climate catastrophe” created a dynamic which put pressure on politics; climate change was established as a concept of “ecological modernisation” and “sustainable development”; ambitious action in terms of climate change	2006/2007 Labor candidate Kevin Rudd brought climate change back onto the political agenda; climate change was put in a global, universal and threatening context, using the catchphrase ‘greatest moral challenge’; the Kyoto Protocol was ratified, and Australia became active in the UNFCCC; Rudd’s efforts to act on climate change, however, became increasingly contentious and unpopular; he trivialised the discussion
2010s	“Aktionsprogramm Klimaschutz 2020 [Action programme climate protection 2020]” was established	Prime Minister Julia Gillard was not accepted with her programme to initiate a carbon tax; 2013, Tony Abbot as Prime Minister says anthropogenic climate change is “crap”; resistance in Australia to any unilateral acceptance of the need to tackle the issue of climate change

3.2.2. *The public’s attitude to climate change*

As politics is an influencer in terms of climate change and – especially in Australia – is able to make, or not make, climate change a national issue, this short chapter provides an overview of public opinion on climate change in both countries and, thus, explores the social consensus about climate change.

The German public’s attitude to climate change is represented in the Eurobarometer Survey 2014 – a special edition which focused on climate change. It was carried out by TNS Opinion & Social network and took place in the 28 Member States of the European Union from 23 November to 2 December 2013 (Eurobarometer 2014, p. 3). Some 27,919 respondents from different social and demographic backgrounds were interviewed face-to-face at home in their mother tongue language (Eurobarometer 2014, p. 3). The following paragraphs show the German results, based on roughly 1,600 interviews (Eurobarometer 2014, p. TS 2).

As many as 70 per cent of the German participants stated that climate change is one of the most serious problems the world is facing (Eurobarometer 2014, p. 14), rating it 7.6 (ranking: 1 = “not at all a serious problem” to 10 = “an extremely serious problem”) (Eurobarometer 2014, p. 23). Answering the question “In your opinion, who within the EU is responsible for tackling climate change?”, most of the German respondents said “business and industry”

(52 per cent), 45 per cent say “national government”, 41 per cent say “the European Union” and 31 per cent of the German respondents were most likely to mention that they have “personal responsibility” for tackling climate change (Eurobarometer 2014, p. 28).

A surprising 65 per cent even said that they have personally taken any action to combat climate change over the past six months (Eurobarometer 2014, p. 32). Of these, 79 per cent added that they “try to reduce waste and regularly separate it for recycling”, 68 per cent said they “try to cut down their consumption of disposal items whenever possible” and 44 per cent said they “buy locally produced and seasonal food whenever possible” as well as “when buying a new household appliance, they chose it mainly because it was more energy efficient than other models” (Eurobarometer 2014, p. 40).

In response to “the view that combating climate change can boost the EU economy and jobs (saying that they either totally or tend to agree)”, 27 per cent of the German respondents “totally agree” and 51 per cent “tend to agree” (Eurobarometer 2014, p. 46). This result shows that the German respondents also sees climate change as an opportunity for the economy.

Moreover, the latest survey “Umweltbewusstsein in Deutschland [Environmental awareness in Germany]” (2014) carried out by the Umweltbundesamt, from 8 July to 6 August 2014, asked 2,117 people who were interviewed online (2014, p. 14) and an additional 2,000 people who were interviewed personally from July 10 to 31 and August 2 to 31, 2014 (2014, p. 15).

Around 19 per cent of Germans say – when asked an open question – that environmental protection is one of the key issues in the country. As a result of this response, environmental protection is fifth in the ranking of the most important issues of the country. “Social security” (37 per cent) and “financial/economic policy” (29 per cent), “pension policy” (24 per cent) and “security and peace” (20 per cent) were felt to be more important by the interviewees (Umweltbewusstsein in Deutschland 2014, p. 19). In the same context, it is noticeable that 76 per cent of the interviewees stated that environmental protection is much more important than economic growth (Umweltbewusstsein in Deutschland 2014, p. 23).

Looking at environmental quality, 86 per cent of the Germans who took part in the survey said that in their own village/town/city the quality is high, 73 per cent said this for Germany in general but only 7 per cent for the whole world (Umweltbewusstsein in Deutschland 2014, pp. 39 ff.). Another central question was whether the population feels that environmental issues represent a burden: 59 per cent of the interviewees say that they “feel an average/normal burden”, 31 per cent “rather less burdened”, and 10 per cent “clearly less burdened”.

Only 3 per cent feel “rather burdened” or “clearly burdened” (Umweltbewusstsein in Deutschland 2014, p. 38). In addition, 44 per cent of the interviewees were “very convinced” that Germany can tackle the issues which arise from climate change. 4 per cent even say that they are “thoroughly convinced” (2014, p. 44). 86 per cent also say that they have to be active and to change their lifestyle to protect the environment (Umweltbewusstsein in Deutschland 2014, p. 33), and 64 per cent say that a “Bruttosozialglück [Cross-national fortune indicator]” should be established, because it is an attractive way to combine environmental issues and economic development (Umweltbewusstsein in Deutschland 2014, p. 34).

So far, this survey shows that most of the interviewees are satisfied with the way they live and they do not feel affected by environmental issues – now or in future (Umweltbewusstsein in Deutschland 2014, p. 45). This assumption is further supported by the fact that they only pay more for environmentally friendly and sustainable products when it pays off (Umweltbewusstsein in Deutschland 2014, p. 73), for example, “always” for household appliances (46 per cent), lamps (48 per cent) and televisions or computer (36 per cent) (Umweltbewusstsein in Deutschland 2014, p. 53). Looking at the results which relate to involvement in environmental issues, this impression is strengthened.

The survey shows that environmental protection is a social norm – not just an alternative movement – in Germany. Nevertheless, mainly volunteers work on this issue: only 8 per cent of the interviewees stated that they are already voluntarily involved in environmental activities (Umweltbewusstsein in Deutschland 2014, p. 63). In addition, 14 per cent of the interviewees said that temperature increases “strongly influence” their health. 39 per cent say they are influenced “less”, while 13 per cent said “not at all” (Umweltbewusstsein in Deutschland 2014, p. 45).

The first impression of the issue culture in Germany is strengthened when you realise that 91 per cent of the interviewees said that it is important for them to live in such a way that one is in peace with the environment and oneself (Umweltbewusstsein in Deutschland 2014, p. 22). 74 per cent are concerned about how much their children/grandchildren will be affected by climate change (Umweltbewusstsein in Deutschland 2014, p. 23). Moreover, 64 per cent say that less consumption would protect the environment (Umweltbewusstsein in Deutschland 2014, p. 22).

Osberghaus et al. (2013) surveyed 6,404 private households with the support of market research institution Forsa between 4 October and 4 November 2012. Most of the households were in North Rhine-Westphalia (22.5 per cent), Bavaria (15.3 per cent), Baden-Wuerttemberg (12.1 per cent) and Lower Saxony (9.8 per cent). The participants answered an online

questionnaire, and households without internet access could take part via a special tool devised by Forsa which could be connected with the television (Osberghaus et al. 2013, p. 3). As many as 81.1 per cent of all participating households believe in general that climate change is already taking place (Osberghaus et al. 2013, p. 13), 70.8 per cent said that it is taking place in Germany (Osberghaus et al. 2013, p. 14), 11.9 per cent said that “It is not currently taking place in general, but will happen” (Osberghaus et al. (2013, p. 13), and 22.7 per cent made this statement for Germany (Osberghaus et al. 2013, pp. 14 f.).

In those households in which inhabitants believe that climate change is happening or will happen, 43.8 per cent thought that it is anthropogenic, 3.7 per cent said it has natural causes and 52.3 per cent said that both factors are responsible for climate change (Osberghaus et al. 2013, p. 16). As many as 84.6 per cent of all participants answered that the global temperature will increase until 2100 (Osberghaus et al. 2013, p. 17). Values for the expected changes in temperature ranged from -40°C to $+50^{\circ}\text{C}$ and the median value was $+3.5^{\circ}\text{C}$ (Osberghaus et al. 2013, p. 18). In addition, 91.0 per cent of the participating households expected that heavy rainfall will increase due to climate change, 90.1 per cent expected an increase in storms, 88.1 per cent more floods, 78.7 per cent extreme heat and 59.1 per cent said that more avalanches and landslides could be expected (Osberghaus et al. 2013, p. 22). Moreover, 6.1 per cent of those interviewed were sure that their personal lifestyle will change due to climate change in the next decade (Osberghaus et al. 2013, p. 22).

An important aspect of the survey by Osberghaus et al. (2013) is that those people who believe in the negative consequences of climate change were “extremely sure” about it (40 per cent) (p. 28). Altogether, the participating households felt “very well” or “rather well” informed about the reasons (58.9 per cent) and consequences (50.0 per cent) of climate change (Osberghaus et al. 2013, p. 30).

However, when they asked the participants for their subjective opinion about statements on climate change, its reasons and consequences, Osberghaus et al. (2013) identified a high uncertainty due to a huge number of “I do not know” answers (pp. 32 f.). These results further support the finding that awareness of climate change is deeply established in the German mindset, because everybody knows about climate change and feels informed. It, however, also shows that this knowledge is only perceived; it is not necessarily well founded.

The Australian public’s attitude to climate change is represented in “Climate of the Nation” (2010), a survey by the Climate Institute of Australia. This survey was carried out during one week in March, April, and June 2010 and each week 1,000 Australians took part in it (Climate Institute of Australia 2010, p. 32).

In Australia, the issue of climate change is ranked as seventh in terms of importance: “climate change appears as a mid-ranking issue below the health system, economy, the cost of housing, jobs and the education system” (Climate Institute of Australia 2010, p. 8). So, only 8 per cent of the Australians say that climate change is “the most important topic”, while 7 per cent say “it is an important topic” for the nation (Climate Institute of Australia 2010, p. 8).

Nevertheless, 68 per cent of Australians are concerned about climate change in general (Climate Institute of Australia 2010, p. 9). Reasons given for concern about climate change were: “water shortages for the cities” (64 per cent), “more droughts affecting farmers” (62 per cent), a “more polluted planet” (61 per cent), a “more polluted Australia” (59 per cent), “destruction of the Great Barrier Reef” and “animals and plants becoming extinct” (58 per cent each) as well as “extreme weather/bushfires” (56 per cent) (Climate Institute of Australia 2010, p. 9).

The information the interviewees saw was felt to be confusing: “Some...believed there was a lack of balanced, unbiased information available and they do not know which sources of information to trust” (Climate Institute of Australia 2010, p. 10). This confusing information had an impact: 23 per cent of the interviewees said that climate change is due to natural causes, while 77 per cent believed that climate change is anthropogenic (Climate Institute of Australia 2010, pp. 10-11). There were, however, differences in opinions about when climate change will take place: “Around two thirds of the people (65 per cent)...believe that climate change is happening now, 17 per cent believe it will happen in the future, while 18 per cent don’t think it will happen at all” (Climate Institute of Australia 2010, p. 11).

As in the German Eurobarometer Survey (2014), 33 per cent of the participating Australians replied “no” when asked whether they would pay more for electricity (Climate Institute of Australia 2010, p. 20), even though 86 per cent of the respondents would “moving to clean energy sources like solar, wind and geothermal” (Climate Institute of Australia 2010, p. 21). This statement might be a sign of the fact that in Australia as well people believe climate change should be tackled, but only when the measures taken do not influence their current lifestyle.

In the survey by the Climate Institute of Australia (2010), a major finding is that the interviewees are very aware of the impact of climate change in their country; however, they leave responsibility for tackling it to the politicians: 85 per cent of the Australian interviewees said that they would “...support a major political party that has a detailed plan to change Australia to using cleaner sources and energy” (p. 22). 74 per cent would support an emissions trading

scheme (p. 23). 73 per cent of the “...people want Australia, as a nation, to lead in reducing pollution and changing to cleaner, smarter energy”, and 20 per cent even wanted Australia to become the world leader in tackling climate change (p. 24).

Of interest, too, are the findings that 36 per cent were not concerned about water shortage in the cities, 38 per cent did not believe that more droughts will affect the Australian farmers, and 44 per cent did not entirely link extreme weather and bushfires to climate change (Climate Institute of Australia 2010, p. 9).

Jackman (2009) carried out an research on how political attitudes shape public opinion on climate change in Australia and the US (p. 1). In Australia, the survey was conducted by Q&A Market Research, Brisbane, using random-digit dialling to sample households in which the youngest resident at home (aged 18 or older) was asked to participate in the survey (Jackman 2009, p. 2). The sample size was 800. The data were weighted so as to be representative of the Australian population by age, gender and state (Jackman 2009, p. 2). Because 31 per cent of the Australian population voted for the Liberal party, many of them are critical of climate change, and 39 per cent of the Australian population voted for the Labor Party, with many voters who view climate change as an important issue, Jackman mainly compared these two groups of voters in comparison to all respondents (Jackman 2009, pp. 2 ff.).

The results of the questions about climate change policy showed that 83 per cent of the respondents agree that “the world’s climate is getting warmer”; 90 per cent of Labor voters and 76 per cent of Liberal voters (Jackman 2009, p. 2). And 67 per cent of all respondents said that the world is getting warmer because of human activity; 78 per cent of Labor voters and 48 per cent of Liberal voters (Jackman 2009, p. 2). The statement “Australia should take steps to reduce its production of greenhouse gases, even if it means fewer jobs and a reduction in living standards for Australians” was agreed to by 59 per cent of all respondents; 70 per cent of the Labor voters agreed and 44 per cent Liberal voters (Jackman 2009, p. 3). Due to the upcoming Copenhagen Climate Conference in 2009, Jackman (2009) also asked respondents if “Australia should delay any steps towards reducing greenhouse gas emissions until it is clear what countries like the United States and China will do on this issue” (p. 3). As many as 46 per cent of respondents agreed with this statement; 40 per cent of Labor voters and 64 per cent of Liberal voters (Jackman 2009, p. 3). Jackman (2009) summarised these results saying that his study representing the Australian public shows that “...Labor has a compelling political incentive to keep the climate change issue salient” (p. 4) and that “supporters of conservative parties are more sceptical about climate change and less supportive of government action than the population-at-large” (Jackman 2009, p. 5).

Summarising the results of the literature in this chapter about climate change and the public sphere, “climate change” as an issue is not seen by the German nation as most important when people are asked openly what they feel is the most important topic. Nevertheless, climate change awareness is high when people are asked explicit questions. The German public mostly believe that climate change is taking place and that the reason for climate change is a mixture of anthropogenic activities as well as natural causes.

Those responsible for tackling climate change are felt to be business and industries and the national government. In addition, most Germans say they are actively involved in climate change protection. Answers about activities are, however, not convincing: these include, for example, waste recycling.

Many are concerned about their children and grandchildren and how they could be affected by climate change. The assumption is that there will be an average increase in temperature of 3.5 degrees, heavy rainfall and more storms and floods. This shows that the consequences of climate change are seen in a negative light. Positive aspects such as an increase in job opportunities are not ranked high.

Two findings from the surveys of the German public’s viewpoint on climate change are surprising: first, it is very noticeable that self-reporting about climate change knowledge differs from the actual state of knowledge about climate change. Second, it is remarkable that especially those people who believe in the negative consequences of climate change are “extremely sure” about it (40 per cent). This is remarkable as the opposite phenomenon was found among the Australian public.

As in Germany, the importance of climate change is mid-ranked in Australia. Australians also agree that climate change has already started, that they are already being affected by climate change and that it is caused by humans. An increase in temperature of about 3.8 degrees is expected by 2100. In this context, it is important that a distinction is made between climate and weather. Consequently, extreme weather is not necessarily seen as evidence of climate change.

Nevertheless, in the context of climate change, Australians are concerned about water shortage, drought affecting farmers, animals and plants becoming extinct, extreme weather and bushfires. As in Germany, Australians say that they are actively combating climate change, although this also mostly involves recycling.

Wehrspaun and Eick (2002) explain this phenomenon by arguing that consumption patterns and ecology are not compatible in Western societies such as Germany and Australia

(Wehrspaun and Eick 2002, p. 1). The authors talk about a "Marginalitätsparadox" [paradox of marginality] (Wehrspaun and Eick 2002, p. 5), which for the authors means that the required ecological behaviour does not correspond with the Western lifestyle and that people often feel they are in a hopeless situation in terms of climate change (Wehrspaun and Eick 2002, p. 5). This is why they demand that communication about climate change should consider the need for economical, ecological and social fairness and should not only refer to marginal ecological benefits (Wehrspaun and Eick 2002, p. 5).

Those who are responsible for tackling climate change are the politicians in Australia, and these act differently: Labor is pro and the Liberal party is against climate change mitigation. Maybe this political conflict is responsible for the fact that fewer than 50 per cent of Australians believe that a global emission reduction scheme is not possible. But also, in relation to their own country, Australians criticise the fact that climate change policy has not been sustainably developed. Table 5 provides an overview of the results of this short chapter.

Table 5: Public sphere: the public's attitude to climate change

Aspect of the public's attitude to change coverage	Germany	Australia
Identify climate change as an important topic/are concerned about climate change	Very high (81 %)	High (68 %)
Feel a personal responsibility for tackling climate change	Moderate (31 %)	No information available
Say others are responsible (industry/politics)	High (business and industry/national government)	High (politicians are responsible)
Think that combating climate change can boost the economy and jobs	Moderate	Low
Feel affected by environmental issues	Low (14 % feel "strongly influenced")	High (about 85 %, dependent on the topic)
Pay more for environmentally friendly and sustainable products	Moderate	Moderate
Feel responsible for future generations	High	No information available
Are aware of the consequences of climate change	High	High
Feel well informed about the causes of climate change	Moderate	Moderate

An examination of the public's attitude to climate change is not part of this research. Nevertheless, the results described in this chapter allow one to draw conclusions about the representation of climate change in the two countries. On the one hand, responsibility for mitigating climate change was assigned to politicians in both countries. Thus, the public in the two countries agree on this issue, which is an aspect that might be reflected in climate change coverage in the two countries. On the other hand, Germans and Australians have a different viewpoint on the extent to which they feel affected by environmental issues: the German public argues that there is relatively little impact, whereas the inhabitants of Australia say that the impact is high. These two opinions might also be discernible when investigating the framing of climate change.

3.2.3. *The impact of lobbying on climate change coverage in Germany and Australia*

To find studies about lobbyism in Germany and Australia is difficult. This should, however, not be a surprise. Lobby groups are very secretive about the way they exert influence as well as about the sources of their funding and, consequently, they are only rarely examined in scientific research.

Because the literature does not clearly explain how the work of these lobby groups/think tanks influences climate change coverage, the following paragraphs try to elaborate on this.

Generally, both industry lobbies, the 'grey' NGOs which are well-organised and financially strong, and the lobby of environmental organisations, the 'green' NGOs, which are often smaller, individual groups with moderate levels of funding, are active in the political arena (see, for example, Walk 2011, Kozák 2010, Enders 2001). Whereas industrial lobbies mainly focus on alliances of convenience with political decision makers (Kozák 2010, p. 93), environmental organisations often create pressure via public opinion, using activities, such as protests during a climate change conference, or the publication of shocking photographs showing the consequences of climate change on the internet (Kozák 2010, p. 72). Thus, grey NGOs mainly convey their interests via the political system, while green NGOs – perhaps due to their more limited funding – create events that can be reported in the media. So, the instruments used by the two lobby groups are different and the one that can influence the political arena might be more powerful.

Walk (2011) explains that NGOs, in general, are well prepared to influence politicians: they have established working groups and networks to represent their interests, they plan their statements designed to influence government meetings very early and they know exactly

about the timetable of the government. Some members of NGOs even become part of government delegations (Walk 2011, p. 11).

Equipped with this knowledge, NGOs, for example, during climate conferences, are able to promote their agenda directly in the responsible committees having access to the bargaining room, a right to speak briefly, and are able to participate in so-called dialogue meetings with governments. Although they cannot be sure that their agenda will be acted on, they are directly heard and are clearly able to influence the discussions about an issue (Walk 2011, p. 11).

In the following section some literature on German and Australian lobby groups and policy making is referred to in order to provide an overview of the issue of lobbyism and the influence that lobby groups have on media reporting.

For *Germany*, there is a text by Bülow (2010), eco-political spokesman and correspondent of the fraction of the SPD parliamentary party in the German federal parliament [Deutscher Bundestag] on the topic Carbon, Capture and Storage (CCS) (p. 5). He talks about lobbyism in the context of the legislative procedure relating to CCS and says that there are two groups of lobbyists: private interest groups, such as trade associations and companies, which aim to maximise their profit – Bülow (2010) calls them “Profitlobbyisten [profit lobbyists]” (p. 4) – and public interest groups which feel responsible for the environment, consumer protection, children and pensioners (Bülow 2010, p. 4). Bülow (2010) makes clear that profit lobbyism is very powerful and has a lot of influence on German politics (p. 4). Alongside the gun, health and automotive lobbies, the energy lobby is strongly represented in Berlin (Bülow 2010, p. 12). In addition, these profit lobbyists are able to talk directly with the delegates whereas public interest groups only have the chance to talk about their issues in public (Bülow 2010, p. 11) – two aspects which are also mentioned by Walk (2011). Altogether, there are about 5,000 lobbyists in Berlin, so every delegate is surrounded by eight lobbyists, and two-thirds of these are profit lobbyists (Bülow 2010, pp. 18 f.).

Referring to his task to implement a law supporting CCS technology (a technology that is designed to prevent carbon emissions reaching the atmosphere), Bülow (2010) explains that the money necessary for such projects was provided by companies as well as the government (p. 5). In addition, the energy lobby tried to speed up the implementation of the law by producing its own law which was designed to reduce costs for their members and include a minimum of restrictions, whereas public interest groups were mainly concerned by the technology itself and whether it could damage or help the climate (Bülow 2010, p. 11). Finally, it was not the energy lobby but the Bauernverband [farmers’ association] which had the power

to refuse the law, because the pipelines required for CCS could damage their land; the law was never discussed in parliament (Bülow 2010, p. 15).

Even so, Bülow (2010) as a member of a project for implementing the law for CCS technology was personally affected and without doubt, therefore, biased, his report shows that the influence of economic interest groups in the German federal parliament is considerable and, thus, indirectly also influences media reporting.

An analysis by the Corporate Europe Observatory (CEO) (2010) examined the major European contributors to climate change denial in the years 2005 and 2006 (p. 9). At the beginning of its research, CEO (2010) made it clear that “in the EU there is no obligation for think tanks to disclose their funding” (p. 2), which explains why it is difficult to find research on this issue. CEO (2010) examined eight European think tanks which produce and/or promote a wide range of material focused on denying climate change, including the Institute of Economic Affairs (IEA), International Policy Network (IPN) and Global Warming Policy Foundation (GWPF) based in the UK, CFACT Europe in Germany, the Spanish Instituto Juan de Mariana, the Danish group CEPOS, the French Institut Économique Molinari and the Austrian Hayek Institute. Then there are the EU’s eight largest emitters, which are ArcelorMittal, BASF, Bayer, BP, E.ON, GDF Suez, Lafarge and Solvay, as well as the three oil companies Repsol, Shell and Total (p. 2). All think tanks refused to reveal the sources of their funding (CEO 2010, p. 2).

Concentrating on the German think tank CFACT Europe, which is a branch of the US Committee for a Constructive Tomorrow, CEO (2010) says that it produces some of the most radical denialist material and is one of the main organisers of the International Conference on Energy and Climate, a European gathering of deniers (p. 5). The conference took place during the Cancún climate talks, inviting prominent climate change deniers, such as Fred Singer and Christopher Monckton as well as Dieter Ameling, former president of the German Steel Federation (CEO 2010, p. 5).

Based on the responses from the EU’s largest emitters and oil companies, oil giant BP admits to financially supporting the UK IEA (CEO 2010, p. 2), saying that “BP, along with many...governments, is keen to see a market-based solution...” (CEO 2010, p. 3). CEO (2010) identified the three most transparent corporations as the French cement company Lafarge, the energy firm E.ON and the German chemical company BASF, which affirmed that they do not contribute to any of the eight think tanks (CEO 2010, p. 8). The question here is whether this is true.

CEO (2010) could not clarify whether European corporations contribute to climate deniers in Europe, but its analysis shows that several of them support at least mainstream think tanks and that most of them do not offer financial transparency. So, the level of unreported financial support of climate denying think tanks might be higher.

In *Australia*, it is also difficult to find research on lobbying; however, for a different reason: Griffiths et al. (2007) explain that the Government of Australia has some strategies in terms of climate change, but these rely on "...voluntarism by industry and corporations and it does not require mandatory targets for energy efficiency or emissions reduction" (p. 424). As an example of such a voluntary programme, Griffith et al. (2007) name the Greenhouse Challenge (1995 to 2005) and its new programme the Greenhouse Challenge Plus (2005 to present) which were both intended to encourage businesses to commit themselves to reducing the impacts of greenhouse gas emissions and climate change (p. 421). Griffith et al. (2007) state that these voluntary commitments have become means of enhancing corporate reputations and are supported by businesses, in particular the coal lobby, as a means of avoiding any regulatory initiatives, which could increase their costs (p. 421).

In addition, the authors refer to the Australian Business Roundtable on Climate Change. The Business Roundtable is comprised of BP Australia, AIG, Origin Energy, Swiss Re, Visy Industries and Westpac Bank as well as, indirectly, the CSIRO and Allen Consulting Group (Griffith et al. 2007, p. 425). This group of companies have released a Report to Government in which it is argued that delaying action to ensure a transition to a low-carbon economy will increase costs to business and the economy (Griffith et al. 2007, p. 421). Griffith et al. (2007) state that "...in line with a market-based institutional governance systems, we saw the emergence of a group of proactive companies arguing that there is an economic case for industrial adjustment to address climate change issues" (p. 421). The Australian Business Roundtable on Climate Change, in addition, criticises the Australian Government for its current approach in that emission targets "...are voluntary and piecemeal, with little consistency between jurisdictions" and calls for the Australian Government to intervene and, thus, provide certainty for business and community investment (Griffith et al. 2007, p. 421). The Australian Government, however, still argues that the impact of climate change can be reduced through initiatives more suited to Australia's economic and geographical position (Griffith et al. 2007, p. 422).

Lobbyism also plays a role in the electricity industry, the single largest producer of greenhouse gases in Australia, which needs, according to Griffith et al. (2007), a nationally uniform regulation to enhance emissions reduction and provide certainty to the industry and

consumers (p. 422). However, most Australian states have established their own carbon trading system, which offers a range of alternatives for the electricity industry if they wish to act in their own interests (Griffith et al. 2007, p. 423). Griffith et al. (2007) claim: "...Climate change can be addressed through a range of voluntary measures undertaken by corporations and individuals while the Commonwealth supports research into carbon capturing technologies" (p. 422). Consequently, for Griffith et al. (2007), climate change policy in Australia is viewed by powerful corporations as a matter for the Australian Government to decide, on the one hand. These corporations delegate responsibility to the State. The Australian Government, on the other hand, offers options for climate change actions to corporations, but there is no pressure behind these activities. So, it stands to reason that the Australian Government either does not want to jeopardise the economic development of the country, which is mainly dependent on the energy economy (see, for example, Hamilton 2001 and Taylor 2014), or does not want to antagonise the powerful energy corporations.

For Griffith et al. (2007), all the examples they presented show that neither corporations nor the State is identified as the responsible institution for transforming industry systems in response to climate change issues in Australia (p. 422). Finally, the authors explain that the current decision of the Australian Government to implement a cap-and-trade carbon trading scheme after 2011, has now become a battleground for lobby groups and major carbon emitters (Griffith et al. 2007, p. 424). This supports the assumption that the Government does not want to lead in terms of climate change issues.

Mitchell (2012), who was many years a state political editor with the Sun-Herald, examines lobbyism in Australia, in general, and confirms the remarks made by Griffith et al. (2007). He says that Prime Minister Kevin Rudd's announcement of a super profit resource tax resulted in "...the most ferocious lobbying campaign ever seen in Australia" (Mitchell 2012). Global corporations Tio Tinto, BHP Billiton and Xstrata formed a multi-million-dollar fund to stop the tax becoming a law by feeding the media with anti-tax 'horror' stories (Mitchell 2012).

"The lobbying machine provided a steady stream of 'talking heads' to the commercial television networks... vilifying the government's tax plan as un-Australian and anti-Australian. The no-tax campaigners include the Business Council of Australia, the Minerals Council of Australia, the federal Opposition and Rupert Murdoch's News Limited newspapers" (Mitchell 2012).

It took the mining companies AUD 27 million and only fifty-three days from the announcement of the government's mining tax proposal to the replacement of Prime Minister Kevin

Rudd with Julia Gillard, without any new election, no vote in parliament and no public debate (Mitchell 2012). In February 2010, only seven months after Julia Gillard took office, BHP Billiton, which admitted spending AUD 4.2 million, the biggest amount used to torpedo the mining tax proposal, declared a record six-month profit of AUD 10.2 billion in a profit jump of 71.2 per cent for the second half of 2010 (Mitchell 2012).

Mitchell (2012), in addition, provides insights into the role of journalists, explaining that in New South Wales lobbyists outnumber the Parliamentary Press Gallery by at least two or three to one. These lobbyists have lists of all metropolitan journalists including their rating in terms of influence, approachability, susceptibility and potential usefulness (Mitchell 2012). An assumption about the Australian climate change news coverage might, therefore, be that it includes more public relations material written by political and industry leaders as well as interest groups, using the media as a tool to spread their opinion about an issue.

Mitchell (2012) admits that the briefings supplied by Australian lobbyists are “...meticulously researched and the information is footnoted and sourced”, because lobbyists are often former journalists who know that information will not be taken seriously if it does not include high-quality material.

Mitchell (2012) finishes his remarks about his experiences with lobbyism by saying that, although the Federal and State Parliaments in Australia have taken steps to regulate lobbyism with the establishment of a registration system and a set of lobbying protocols, the influence on legislators and the media continues to grow.

In summary it can be said that, both, German and Australian’ politicians are influenced by lobby groups. The literature shows that, in both countries, the lobby/interest groups are mainly from the energy/fossil fuel industry. In Germany, these lobby/interest groups are secretive about the amount of money they invest in lobbyism. In Australia, the lobby/interest groups have different influence in each national state, which results in different climate change policies. In both countries, the influence of lobby/interest groups on climate change politics is not clearly identifiable. Nevertheless, the literature about lobbyism in Germany and Australia shows the power of lobby groups in the two countries as well as their ambitious action against economic changes related to climate change.

This short chapter about lobbyism shows that the influence of lobby groups could be identified as critical for mitigating climate change or even as climate-sceptic. Therefore, it is of interest to identify climate-change-sceptical coverage. Knowing that the so-called “balanced” news reporting is a common journalistic practice in Australia (see Chapter 3.1), the

assumption is that the more lobbyists have a say, the more climate-change-sceptical views appear in climate change coverage.

It can also be assumed that lobbying influences the politics around climate change. However, the discussion of lobbying in this chapter is just exploratory, not in-depth.

The main aspects about the impact of lobby groups on climate change politics can be found in Table 6.

Table 6: Societal sphere: the impact of lobbies on climate change politics in Germany and Australia

Aspect of lobbying	Germany	Australia
Lobbyism is part of the government system	High	High
Economic interest groups in the national government influence climate change discussions	High	High (vary from State to State)
Financial transparency in terms of climate change lobbying	Low (some sources of funding are revealed)	Moderate (through round tables, companies admit their lobbying activities)
Journalists are used for – and profit from – lobbying	No information available	High

3.2.4. Energy supply, natural resources and the climate of Germany and Australia

Further external aspects, that have to be known for this work, are the conditions of energy supply, natural resources and the climate in the two countries. Analysing these conditions provides an overview of the role of fossil fuels as well as nuclear energy, two important issues for the climate change discussions. It might, moreover, show what is perceived as normal and abnormal climate.

Comparing the *energy supply of Germany and Australia* (see Figure 4), AGEB (2016) for Germany and AER (editions 2007-2012) for Australia provide the following information: It is clear that the diversification of energy sources is much more diverse in Germany than in Australia. The amount of nuclear energy was reduced sharply in 2011, the year after the nuclear catastrophe in Fukushima, whereas the amount of renewable energy increased in the same year and the year after. Nevertheless, fossil fuels (brown coal, black coal and natural gas) are still the main energy sources for Germany.

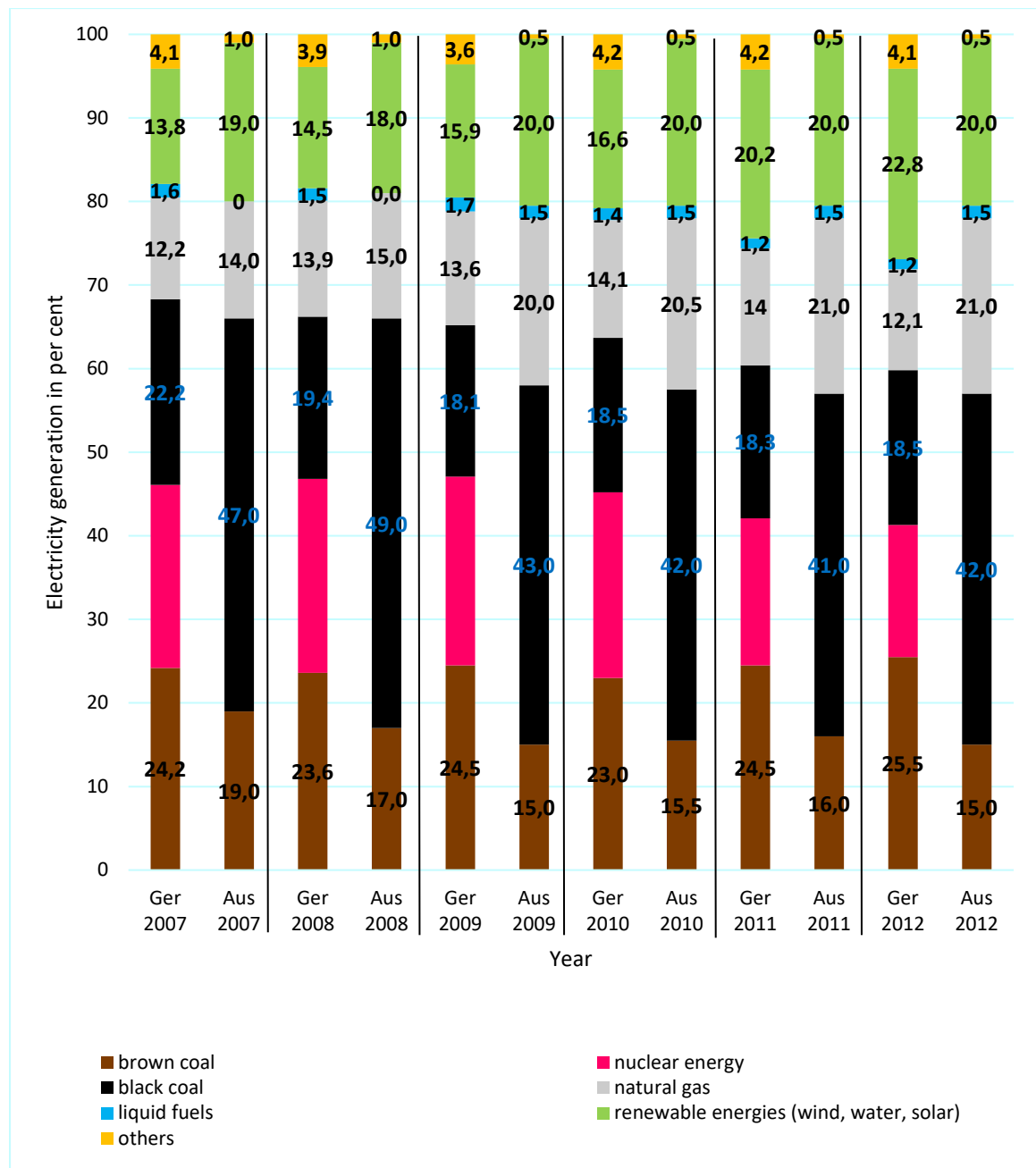


Figure 4: Comparison of energy supply in Germany and Australia by source for the years 2007 to 2012

Sources: AGEB – AG Energiebilanzen e. V., Stromerzeugung nach Energieträgern 1990-2015, and AER 2007-2012, Registered generation capacity, by fuel source, State of the energy market 2007-2012

It is conspicuous that nuclear energy is not part of the *Australian* energy mix. The country relies on black and brown coal. The amount of renewable energy is more or less stable, while the use of natural gas declined during the research period.

Looking at *natural resources* with a focus on resources for *energy generation* (Figure 5), volumes of brown coal as well as nuclear and renewable energy are sufficient in *Germany*, while energy production based on black coal, natural gas, and especially liquid fuels are mainly dependent on imports (BGR's Energiestudie 2013). In this context, BGR (2013) provides information about the proportional distribution of the energy mix, with liquid fuels having a 33 per cent share of Germany's energy mix, natural gas a 21 per cent share, brown coal and black coal each having a 12 per cent share, while energy from renewables had a 12 per cent share and nuclear power a 8 per cent share (p. 15).

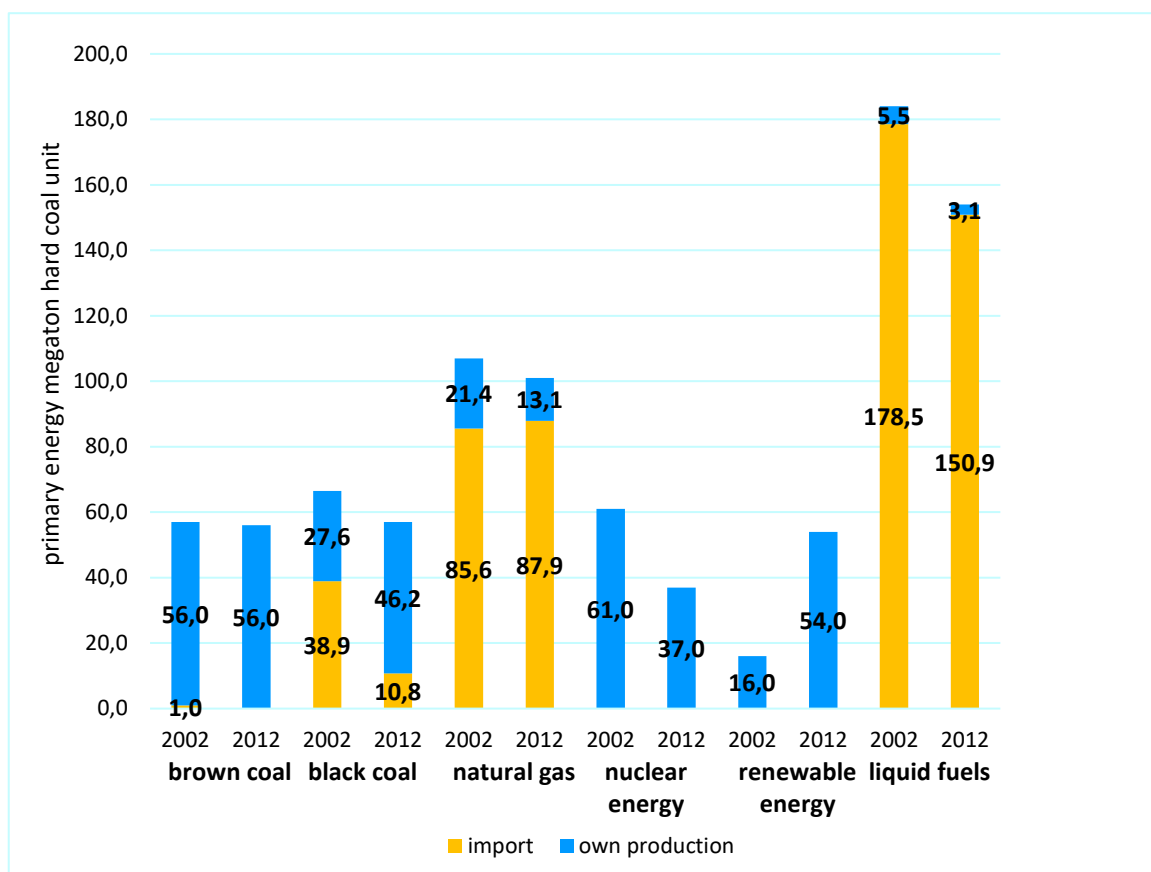


Figure 5: German resources for energy generation

Source: BGR – Bundesanstalt für Geowissenschaften und Rohstoffe, Energiestudie 2013, p. 15

In 2012, primary energy consumption – i. e. energy that has not been subjected to any conversion or transformation process, including oil, coal, natural gas, water and nuclear energy as well as renewable energy – in kilograms of oil equivalent per capita (one oil equivalent is 41.868 mega joule) was 3.88 per head in Germany (The World Bank 2018).

Australia's energy generation is substantially based on coal which is produced domestically: the country earns AUD 38 billion from the export of 392 megatons of coal and is the second largest coal exporter after Indonesia (Energy in Australia 2013, p. 67). Based on the study Energy in Australia (2013), natural gas is mainly renewable and bioenergy is only produced for own use. The volume of renewable and bioenergy produced is, however, very small. Liquified petroleum gas and refined products are imported for energy generation (see Figure 6) (Energy in Australia 2013, p. 4). The energy mix consists of black and brown coal (35 per cent), oil (36 per cent), natural gas (25 per cent) and renewables (4 per cent) (Energy in Australia 2013, p. 4).

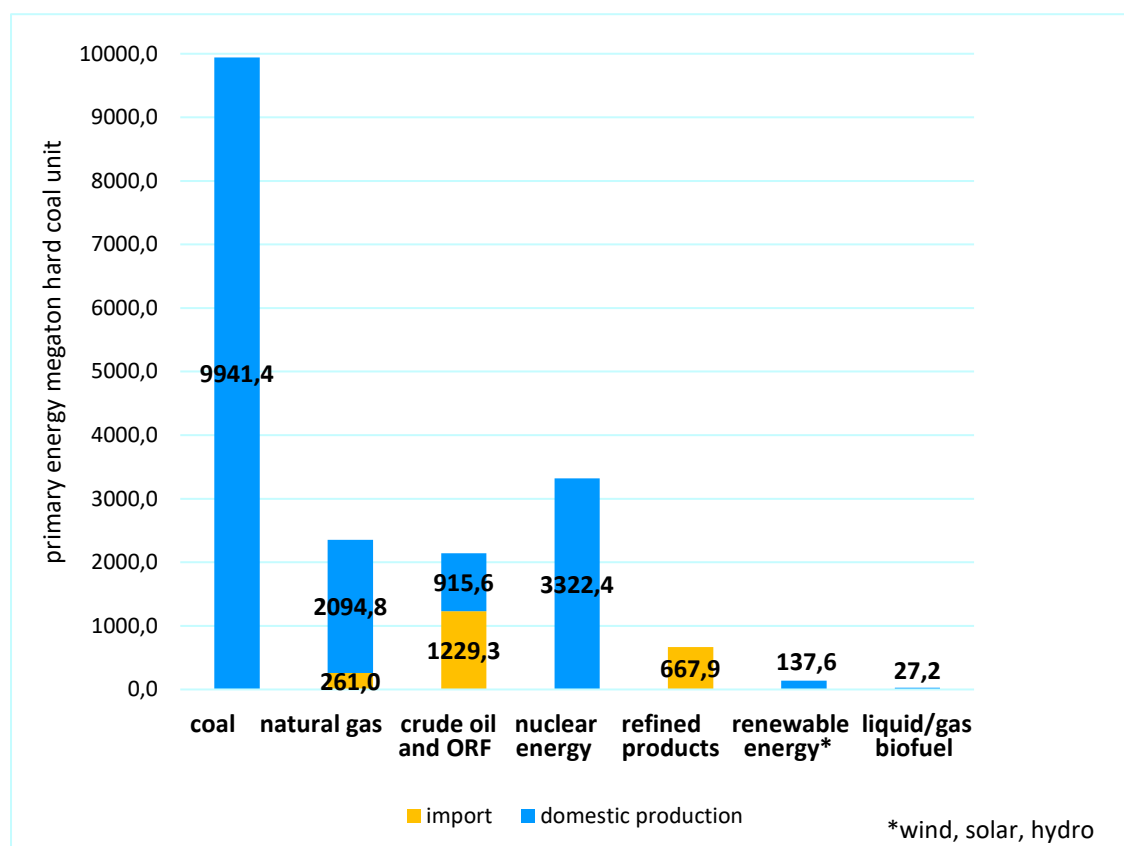


Figure 6: Australian resources used for energy generation in 2012

Source: Energy in Australia 2013, pp. 21 f.

In 2012, the primary energy consumption – i. e. energy that has not been subjected to any conversion or transformation process, including oil, coal, natural gas, water and nuclear energy as well as renewable energy – in kilograms of oil equivalent per capita (one oil equivalent is 41.868 mega joule) was 5.58 per head, in Australia (The World Bank 2018).

Reviewing the *climate* in both countries, the situation in *Germany* was more or less stable for a long time, with reliable climate and weather conditions; extreme weather, such as heavy rainfall, was not part of German everyday life (Germanwatch 2007, p. 4). The situation, however, has since changed. The Deutsche Wetterdienst (DWD) has predicted that Germany is likely to experience the following changes relating to climate until 2050: in the summer-time, temperatures will increase by about 1.5 °C to 2.5 °C in comparison to 1990 and during winter time, temperatures will be between 1.5 °C and 3 °C hotter; there will be less rainfall (about 40 per cent) in summer whereas in winter the rainfall will increase by about 30 per cent (DWD 2016). Over the last 100 years, temperatures increased by 0.8 to 1.0 degree Celsius, rainfall increased in winter and, there was simultaneously, less snow (Germanwatch 2007, p. 4). Extreme climate events, such as heat waves, heavy rainfall, and squalls, have increased over the last 20 years (Germanwatch 2007, p. 4).

The prediction is that increases in temperature as well as the changes in rainfall will be reflected in the environment and the daily routine of Germany's population (Germanwatch 2007, p. 8). Because nature will react with longer vegetation periods and changes in biological diversity, human beings need to expect extended allergy cycles as well as heat waves, which can cause large numbers of deaths (Germanwatch 2007, p. 8). Increases in temperature and heavy rainfall, in addition, will confront the German population with serious effects on the ecosystem as well as socio-economic processes due to sea-level rise, extreme weather glacier meltdown and floods (Germanwatch 2007, p. 8).

Australia's climate is dominated by dry, sinking air from the subtropical high-pressure belt, which moves north and south with the seasons and makes the rainfall pattern over Australia strongly seasonal (Australian Bureau of Meteorology 2014). Australia's climate has warmed by 0.9 °C since 1910, and the frequency of extreme weather has changed, with more extreme heat, fewer cool periods and reduced rainfall, especially in the southwest, where there is reduced winter rainfall (Australian Bureau of Meteorology and CSIRO 2014, p. 3). Extreme heat has increased, resulting in an extended fire season (Australian Bureau of Meteorology and CSIRO 2014, p. 3). Low rainfall combined with very high evaporation (particularly in inland Australia) leads to low surface water flows and seasonal river systems (Australian Bureau of Meteorology 2014).

Australian temperatures are projected to continue to rise: by 2070, compared to 1980 to 1999, warming is projected to be 1.0 to 2.5 °C for low greenhouse gas emissions and 2.2 to 5.0 °C for high emissions (Australian Bureau of Meteorology and CSIRO 2014, p. 15). The Australian population will, thus, need to contend with a growing number of extreme fire-weather days in Southern and Eastern Australia on average, an increased proportion of intense cyclones and sea-level rise around the Australian coastline; higher mean sea levels will increase the frequency of extreme sea-level events (Australian Bureau of Meteorology and CSIRO 2014, p. 15).

Summarising this section about energy supply, natural resources used for energy generation, and climate, Germany uses less fossil fuels than Australia, due to a wider range of energy sources. Nuclear power is part of Germany's energy mix, whereas Australia does not use nuclear power at all. Germany produces energy domestically from brown coal, nuclear and renewable energies. In Australia, renewable and bioenergy is exclusively produced within the country alongside natural gas. However, this production is at a very low level. Australia's energy comes mainly from coal. The coal industry plays a major role in Australia's economy. Australia is a leading exporter of coal. This is why the switch from coal to renewable energy for energy production is a massive challenge.

The climate in Germany will include hotter summers and winters, less rainfall in summer, and more rainfall in winter by 2050. The consequences of climate change are expected to be longer vegetation periods, changes to biological diversity, sea-level rise, extreme weather, glacier meltdown and floods. In addition, humans need to expect extended allergy cycles and more frequent heat waves, which can cause large numbers of deaths. The climate in Australia has warmed, resulting in extreme heat, fewer cool periods, reduced rainfall and extreme fire-weather conditions. Moreover, Australia already has low surface water flows and seasonal river systems. In future, Australia will face a growing number of extreme fire-weather days and intense cyclones as well as extreme sea-level events (see Table 7).

For the climate change coverage which is surveyed in this research, these results lead to the expectation that, on the one hand, Australian newspapers will have a larger number of reports about the effects of climate change, because the lifestyle of the people is already being affected by these effects, and it may include more calls for action in terms of climate change. German climate change coverage, on the other hand, is likely to become more diverse, referring to the problems of climate change, the causes as well as the effects of climate change, responsibilities and calls for action in terms of climate change.

Table 7: Sphere of structural conditions: energy supply, resources, and climate in Germany and Australia

Aspect of energy supply, re-sources and climate	Germany	Australia
Energy supply mainly based on coal and oil/liquid fuels	Moderate (57 % of the energy mix)	High (71 % of the energy mix)
The coal industry is a major economic force	Moderate	High
Use of nuclear power	Moderate (8 % of the energy mix)	None
Increase in renewable energy within 5 years	High (plus 65 %)	Extremely low (plus 5 %)
Production of renewable energy	Moderate (22.8 % of electricity is generated from renewables)	Moderate (20 % of electricity is generated from renewables)
Consequences of climate change (for example, hotter summers and winters, less rainfall in summer, extreme heat, extreme fire-weather conditions, low surface water flows)	Low (expectations of scientists for 2050 are introduced)	Extremely high (climate change has already happened; current changes are experienced by the public)
Scientific awareness of further consequences of climate change	Extremely high (expected: longer vegetation periods, changes to biological diversity, sea-level rise, extreme weather, glacier meltdown and floods, extended allergy cycles and frequent heat waves which can cause large numbers of deaths)	Extremely high (expected: a growing number of extreme fire-weather days, increased frequency of intense cyclones and extreme sea-level events)

3.3. Journalistic influences from inside the media company

Researchers have identified that there are forces from inside the media company which influence the representation of issues in newspapers (see, for example, Cox 2006, Boykoff and Boykoff 2004). Aspect which are imposed from the media owner are the usage or non-usage of certain news values within in newsroom (see, for example, Robie 2008, Caple and Bednarek 2013, Masterton 1998), there is the pressure from inside the media company about how an issue in a newspaper is represented (see, for example Cox 2006, Boykoff and Boykoff 2004) and there are the non-democratic or hierarchical newsroom processes (see, for

example, Donk et al. 2012, Josephi 2011). From discussions of these issues it is clear that coverage is not always objective but can be influenced by a number of interests.

One major powerful interest is the management of a media company. It can regulate the way in which the news is represented and disseminated. The management of a newspaper, for example, could reduce the amount of space which is available for a news story (Cox 2006, p. 164) and "...increases pressure on journalists to dramatise issues to ensure that a story gets out" (Cox 2006, p. 164). The reason for this is that news is now a source of profit. Boykoff and Boykoff (2004) provide an overview of the various influences, writing that:

"...the content of news is affected by three normative orders...: political norms (the idea that the proper role of the mass media is to provide the citizenry with political information that will lead to enhanced accountability on the part of elected officials), economic norms (the constraints on journalists working within a capitalist society in which reporting must be both efficient and profitable), and journalistic norms (objectivity, fairness, accuracy, balance)" (p. 126).

The *organisational influence of media companies in Germany and Australia* (besides UK, Finland, Latvia, the Netherlands, Austria, Portugal, Sweden and Switzerland) was evaluated in *The Media for Democracy Monitor* by Donk et al. (2012). Donk et al. (2012) start from the premise of current media system science, which claims that the media reflects the system of political power and control (p. 501). So, Donk et al.'s (2012) research refers to political thought about the substance of democracy [Demokratiegehalt] in established democracies – the Demokratiebarometer [the democracy barometer] – which also includes an index about the quality of media systems in terms of performance and the provision of information (p. 502).

For their research, Donk et al. (2012) investigated a model which includes the three main functions of journalists in a democracy: 1. freedom, i. e. the guarantee that there is a free flow of information; 2. equality, i. e. an open forum for interests as well as opinion; and 3. control, i. e. the control of social power (p. 505). Every of these functions were associated with some indicators which, on the one hand, refer to the media structure and, on the other, refer to the performance of the media company; for example the indicator "freedom" has "numerous news sources" as a structural aspect and "rules for democracy within a news-room" as a performance aspect (Donk et al. 2012, pp. 505 f.).

The findings of Donk et al. (2012) are based on a secondary analysis of the indicators cited, with data from 2008, as well as on interviews with leading journalists in the most important news media – including newspapers, public radio, public television, private television and

news websites – for each country, and were completed in 2010 (p. 506). The most important research question raised by Donk et al. (2012) for this chapter of the research is the question: how democratic is the organisation of news production in leading media? (p. 507).

The findings of Donk et al. (2012) show that the *media companies' influence in Germany* is a special case, because institutional forms of debate – for example, editorial meetings, which take place regularly – are part of the newsroom culture, a culture which is based on the freedom of the press and guarantee everyone an equal voice in a discussion (p. 509). However, this is not the case when selecting leading positions; these are selected in hierarchical structures (Donk et al. 2012, p. 509). In an earlier article about his findings in the context of *The Media for Democracy Monitor*, Marcinkowski and Donk (2009) wrote that “...management usually appoints editors-in-chief and, in most of the cases, journalists are not involved in the process” (p. 208). As one of two exceptions, Marcinkowski and Donk (2009) name *Süddeutsche Zeitung*, which has established a board of leading editors that could impede the owners' choice with a quorum of two-thirds (p. 208). Another noticeable consequence of the power structure in a newsroom is that the choice of interview partners is decided by the editor-in-chief or the heads of departments (Marcinkowski and Donk 2009, p. 209). Regarding monopolisation, Marcinkowski and Donk (2009) state clearly that, especially in the regional newspaper market, there is a tendency towards newspaper conglomerates in Germany (p. 209).

For Donk et al. (2012) there is room for improvement when it comes to democratic-deliberative processes in the newsroom (p. 510): even though journalists only feel committed to work investigatively in a few newsrooms, it is part of the editorial outlines (p. 514). In addition, Donk et al. (2012) remark that in Germany there are influential journalistic unions as well as a strong education in media ethics; however, the issue of violation of media ethics is not debated openly (p. 513).

In *Australia*, journalists do not formally have a voice regarding the choice of leading staff (Donk et al. 2012, p. 509). In addition, although there are no written regulations on how decisions about news are to be made, the newspaper staff decides together about news selection (Donk et al. 2012, p. 509).

Josephi (2011), who used the results of *The Media for Democracy Monitor* for her *Australian Journalism Monographs*, affirmed Donk et al.'s (2012) finding, writing that consultation, participation and plurality of views are part of Australia's newsroom culture (p. 19). However, as in Germany, the editor is the boss and, thus, also in Australian newsrooms the struc-

ture is hierarchical (Josephi 2011, p. 19). Josephi (2011) even stated that the degree of independence of an Australian newsroom from its owner or the management is a difficult subject, due to hand-on media owners (p. 20).

It is, therefore, no surprise that Donk et al. (2012) explain that there is a high concentration in media ownership in Australia with a lot of influence across all genres and a great deal of power in terms of spin (p. 511). Besides, Josephi (2011) brings a surprising aspect into the discussion, saying that every state or territory nominates its top stories; however, the decision about which one is published is made by media outlets with national news values in mind (p. 20). The consequence of this decision is that regional news tends to take a backseat. In terms of climate change coverage, these newsrooms tend to ignore regional climate change issues, giving national issues more priority – based on the interests and criteria for newsworthiness in the respective newsroom.

In Australia, ethical standards are part of journalistic education (Donk et al. 2012, p. 513). “However, internally the media in Australia show few democratic traits due to the influence of media owners” (Josephi 2011, p. 21).

Summarising these outcomes about influences from inside the media company (see Table 8), the assumption that German journalism is based on strong ethical rules and regulations is confirmed. Discussions between journalists in the newsrooms are institutionalised, regulated by the freedom of the press and by hierarchical structures. In Australia, there are no regulations about how journalists should cooperate and there is a participatory newsroom culture. Nevertheless, in Australian hierarchical structures also play a major role when filling a leading position and deciding about newsworthiness.

Another difference between Germany and Australia is that a few media owners build huge conglomerates across all media genres in Australia, whereas there are more media owners in Germany.

For the coverage which is studied in this research, these facts may well result in a broader variety of opinions, perspectives, and aspects about climate change in German newspapers than in the climate change coverage of the Australian newspapers.

Table 8: Institutional sphere: comparison of German and Australian newsrooms in terms of internal factors of influence

Aspects of internal influence	Germany	Australia
Debate, consultation, participation and plurality are part of the newsroom culture	Yes	Yes
People in leading positions are selected in hierarchical structures	Yes	Yes
The choice of interview partners lies with the editor-in-chief or the head of departments	Yes	No information available
Newsroom processes are democratic	Yes	No, because of strong influence of media owners
Media ethics issues	Yes, but not debated openly	No information available

3.4. The journalistic profession in Germany and Australia

Although journalists have a major stake in news coverage, being the authors of all articles published in a newspaper, there are only a few studies about journalistic work from a journalistic point of view. This, however, is an important perspective for this research, because it helps to explain which influencing factors a journalist has to deal with while doing his/her job.

At the beginning of every journalistic career, there is training during which journalists learn their trade. Harnischmacher (2010), Hirst (2010), Schäfer (2012), the United Nations Environment Programme, Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production & Grimme Academy (2011), Cox (2002) and Dernbach (2012) discuss the education of journalists and their route into the newsroom. During their education, the earliest influencers of journalism are also identified from the authors.

In addition, there are aspects which are intrinsically motivated, such as the ideological identity of journalists and, thus, how they see their work in society. A comparison of several countries in terms of journalistic ideological identity was made by Hanitzsch et al. (2011) as well as Hanusch (2008), who was responsible for the Australian part of Hanitzsch et al.'s (2011) survey. The comparative aspect in Hanitzsch et al.'s (2011) survey is of special interest for this research, because it is currently the only study that includes the journalists' viewpoint on their work as well as a comparison between countries. Moreover, Weischenberg et al. (2006), Hanusch (2008), Lünenborg and Berghofer (2010) and Rodrigues (2008)

studied the self-concept of journalists in the two countries as well as how they are able to put it into practice. These two aspects – the ideological identity as well as the self-concept of journalists – show how much the opinion of a journalist plays a role in the two countries examined in this research.

The individual perspective of journalists in Germany and Australia as well as aspects which influence this perspective are the main issues in this chapter: In Chapter 3.4.1, this research reviews journalists' attitudes to work. How do they define their institutional role and what is their epistemology and ideological identity? Chapter 3.4.2 – about the socialisation of journalists – discusses how journalists are educated. Chapter 3.4.3 identifies their professional self-concept, so what tasks do they have (from their own perspective). Chapter 3.4.4 shows the news values which are mainly relevant in Germany and Australia in general as well as in relation to environmental/scientific coverage of which climate change is one part.

3.4.1. *German and Australian journalists and their attitude to work*

With their “World Journalism Project”, Hanitzsch et al. (2011) compare the institutional role, epistemology, and the ideological identity of journalists in Germany and Australia during the period in which this research took place.

Hanitzsch et al. (2011) carried out a comparative survey of 1,800 journalists in 18 countries (p. 273). Concentrating on Germany and Australia, he asked 100 journalists working in 20 news organisations in each country, including daily newspapers, general-interest weeklies (magazines/newspapers), one news agency as well as television and radio stations (pp. 277 f.). Online newsrooms were not part of the sample (Hanitzsch et al. 2011, p. 276). However, Hanitzsch et al. (2011) selected five journalists each with some editorial responsibility in the 20 newsrooms, while the other 95 journalists were selected randomly (p. 276). The methodology used for Germany and Australia, the two countries which are of interest for this research, were telephone interviews about their institutional roles, their epistemologies and ethical views (Hanitzsch et al. 2011, p. 276).

The authors started with a literature review of the three aspects (institutional roles of journalism in society, journalist's epistemologies and ethical ideologies) (Hanitzsch et al. 2011, pp. 275 f.). Hanitzsch et al. (2011) first identified three dimensions of journalistic institutional roles: 1. Intervention, illustrating two types of journalists who are either involved, socially committed, assertive and motivated, or uninvolved, dedicated to objectivity, neutrality, fairness and impartiality, 2. Power distance referring to either a journalism that is a

“fourth estate”, which challenges those in power, or opportunistic journalists, who see themselves as partners of the ruling elites, 3. Market orientation referring to the target audience in their role as a citizens/consumers, which is represented by journalistic cultures that either give priority to public interests or emphasise political information to create an informed citizenry (p. 275).

Second, epistemological underpinnings are discussed in terms of objectivity: 1. objectivism, i. e. journalists either believe that there is an objective truth, which can be reported, or all representations are inevitably selective and require interpretation, and 2. empiricism including a journalistic culture which either emphasises observation, measurement, evidence and experience, or accentuates reason, ideas, values, opinion, and analysis (Hanitzsch et al. 2011, p. 276).

Third, for the ideological identity, Hanitzsch et al. (2011) use the two dimensions of ethical ideologies which the psychologist Forsyth published in 1980. These are: 1. relativism which refers to journalists who have either the opinion that ethical decisions are dependent on the context or that journalists should rely on moral absolutes regardless of the context, and 2. Idealism which refers to journalists who are either highly idealistic and means-oriented or less idealistic and goal-oriented (p. 276).

A master questionnaire, based on the findings in the literature review and developed collaboratively to guarantee intercultural validity, was first developed in English and then translated into the relevant languages, using simple wording to reduce potential translation problems (Hanitzsch et al. 2011, p. 278).

The first list of 12 items, which was designed to measure the institutional roles of journalists, includes five possible responses: “extremely important”, “very important”, “somewhat important”, “little important”, and “not important at all”, the second list of 14 items designed to identify journalists’ epistemological beliefs and ethical ideologies includes the options “strongly agree”, “somewhat agree”, “neither agree nor disagree”, “somewhat disagree” and “strongly disagree” (Hanitzsch et al. 2011, p. 279).

First, the findings of Hanitzsch et al. (2011) in terms of the institutional role show that, in Germany, there is “a fairly strong emphasis on the motivational potentials of journalism...” (p. 281) which includes values, such as “...non-involvement, detachment, monitoring the government, as well as providing political and interesting information to motivate the people...” focusing on political information (pp. 281 f.). Australian journalists have the same institutional role, but they focus on what they think is “interesting information” (Hanitzsch et al. 2011, p. 282). So, political issues are of great significance in Germany whereas, in

Australia, newsworthiness is not connected with politics. This is why it is of considerable interest to compare the news values of Germany and Australia, an aspect which is discussed in Chapter 3.4.4.

Hanitzsch et al.'s (2011) findings about the second aspect, journalism epistemology, show that the most important issue for German journalists is to publish only material which is verified (p. 283). For Australian journalists it is most favourable to provide analysis of events and issues (Hanitzsch et al. 2011, p. 283).

Regarding ethical ideologies, the authors found that German journalists do not accept personal influence, such as own interpretations of events and issues, whereas Australian journalists agree to an "...interpretative but factual mode of reporting" (Hanitzsch et al. 2011, p. 284). Moreover, questionable methods of reporting are not an option for German journalists, as Germany is part of the "absolutist" paradigm which states that journalists "...usually follow universal rules of ethical professional conduct..." (Hanitzsch et al. 2011, p. 286). These results are interesting, but older studies claim the opposite (see, for example, Donsbach 1982, Köcher 1985, Kepplinger 1979). However, Weischenberg et al. (2006) also stated in his research on journalism in Germany, which is further discussed in Chapter 3.4.3, that the majority of German journalists are much more reluctant to engage in unethical practices than they were 12 years ago (p. 257). The unauthorised use of government documents is acceptable for some German journalists (25 per cent), while other practices are used vanishingly low (masquerading as an employer: 11 per cent, adopting a different opinion to get information: 11 per cent, pretending to be a different person: 8 per cent, paying money for information: 6 per cent, using hidden microphones/cameras: 5 per cent) (Weischenberg et al. 2006, p. 257). Admittedly, these results do not completely exclude unethical behaviour as Hanitzsch et al. (2011) does, but it shows that there might be a change of thinking in journalism in Germany.

Unlike in Germany, Australian journalists are more open to unethical behaviour. There journalists say that it "depends on the situation" (Hanitzsch et al. 2011, pp. 285 f.).

Hanusch (2008), who was responsible for the Australian research on 100 journalists in the mainstream media as part of the global journalism research project carried out by Hanitzsch et al. (2011), published his findings in another journal with more detailed results about the Australian journalism culture. The basis for his survey was the aforementioned methodology and framework developed by Hanitzsch et al. (2011, p. 5).

Concentrating on the epistemology, Hanusch (2008) says that Australian journalists claimed that "...their beliefs and convictions did not influence their reporting" (p. 7). Regarding ethical ideologies "...two-thirds believe there are ethical principles which should always be followed" (Hanusch 2008, p. 7). Both aspects are examined together by Hanusch (2008) with the following results: 81 per cent of the participating journalists "agreed" or "strongly agreed" that "I make claims only if they are substantiated by hard evidence and reliable sources.", 78 per cent stated that "I provide analysis of events and issues in my work.", 69 per cent stated that "I remain strictly impartial in my work.", 70 per cent said that "There are ethical principles which are so important that they should be followed by all journalists, regardless of what situation and context.", and 69 per cent stated that "I do not allow my own beliefs and convictions to influence my reporting" (Hanusch 2008, pp. 9 f.). These results somewhat soften the assumption of more sensational coverage in Australian journalism because of terms such as "hard evidence", "reliable sources" and "strictly impartial". Nevertheless, that Australian journalists "provide analysis" means that they interpret the findings represented in their coverage. Hanusch (2008), however, comments that journalism in Australia follows "...the traditional values of the media as the fourth estate..." (p. 8) and its journalists are "...passive, adversarial and objective reporters..." (p. 8).

Comparing the results for Germany and Australia in relation to the work attitude of journalists (see Table 9), there are some major differences in how journalists define their work. In Germany, journalists seem to refer to strong ethical rules and regulations, which do not accept opinions in the form of interpretation and analysis of the represented facts. In Australia, a personal view on a topic seems to be acceptable as long as supporting facts are given. These characteristics in terms of Australian journalists' work attitude is to see as critical as also sceptical voices – i. e. journalists with a climate-change-sceptical attitude – might have a say and might spread this opinion via their medium. Facts to support climate-change-sceptical media messages could easily be found as there exists also scientific work about the non-existence of climate change.

Moreover, the fact that German journalists concentrate on "political information" whereas Australian journalists look for "interesting information" gives rise to the assumption that there may be more articles with a focus on political actors in German newspapers than in Australian ones.

Table 9: *Subject sphere: comparison of German and Australian journalism work attitudes*

Aspect of journalism work attitude	Germany	Australia
Material must be verified	High	Extremely high
Special focus	High (political information)	High (interesting information)
Provides analysis of events and issues	Low	High
Personal opinion/interpretation	Low	High
Ethical principles should be followed by all journalists	High	High
Values of the media represent the "fourth estate"	No information available	High

3.4.2. *German and Australian journalists and their socialisation*

Which are the qualities of a good journalist? This question is of major interest when comparing news coverage in two countries, because the socialisation of journalists can be very different in each country and, thus, can influence the representation of an issue such as climate change.

The *socialisation of journalists* starts during their education. In Germany and Australia, journalism education faces similar challenges. Harnischmacher (2010), who reviews and validates the *German* system of journalism education, explains that it can be summarised as "Studium plus X [studying plus x]" (p. 357). Even though the education of journalists played a major role in the university reformation in the 1970s and Germany took a leading role in including science in journalism education, the practical part of journalism involved training in the media companies (Harnischmacher 2010, p. 358). For Harnischmacher (2010), the central issue is that media science and journalism practice during a study is not accepted by the media sector as a proper education and is not even preferred over other studies (p. 361). For him, it is of great importance that journalism studies increase their relevance in the media sector (Harnischmacher 2010, p. 364).

Exactly the same issue is referred to by Hirst (2010), who discusses recent scholarly debates about what is accepted as a good journalism education in *Australia* (p. 83). He says that he as a journalism educator hoped that the media industry would accept his graduates as professionally competent (Hirst 2010, p. 84). He further explains that there is a battle of journalism education versus "...the conservative industry view that theory is out of place in

journalism training” (Hirst 2010, pp. 87 f.). Hirst (2010) demands that journalism educators place emphasis on learning and reflexive praxis, so that future journalists are able to analyse their socio-political environment (p. 93).

The fact that a journalist is only seen as a ‘proper’ journalist when learning journalism skills in a newsroom gives the media companies a lot of power. They not only decide who gets the chance to be a journalist due to choosing trainees themselves. The journalist also has the impression that the traineeship is of higher value than what he/she has learned during journalism studies. So, the journalism freshman is familiarised with the philosophy of a media company and is influenced by its owners. This is why this research also examines the organisational system of the media companies in a later chapter. To answer the question about the qualities of a good journalist, the answer revealed by this discussion is: having experience of professional practice.

Having experience of professional practice is, however, a special challenge in some areas of reporting, such as in environmental journalism. Environmental journalism, or even climate change journalism, is not a subject a journalist could learn at university or any journalism school (see, for example, Schäfer 2012, United Nations Environment Programme, Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production & Grimme Academy 2011, Cox 2006, Dernbach 2012). Thus, it is also difficult for researchers to research on climate change journalism because it does not exist as a structured educational training. Schäfer (2012) discusses environmental journalism in Europe. He explains that every council meeting of the European Union reveals 27 versions of the same environmental topic (Schäfer 2012, p. 67). He further states that, therefore, the training for European journalists needs to include the environmental issues of the European Union (Schäfer 2012, p. 72). In 2011, the United Nations Environment Programme and the Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production together with the Grimme Academy (2011) developed a guideline for a journalism course to teach future journalists how to handle sustainability, which is defined as considering environmental aspects as much in one’s own everyday life as social and economic aspects (p. 16). In this context, Cox (2006) stated that “...few reporters have training in science and knowledge of complex environmental problems... [and] few news organisations have the financial means to hire such talent” (p. 174). He also claimed that, due to the fact that “the real environment is altogether too big, too complex, and too fleeting for direct acquaintance..., journalists have sought ways to simplify, frame, or make ‘maps of the world’ to communicate their stories” (Cox 2006, p. 177). Dernbach (2012) explains that environmental journalism has never become a

separate department, but it is represented in the media in five different concepts: as ecological-oriented economic journalism, anti-economy-oriented sustainability journalism, as scandal journalism (focusing on negative events including the risk of Armageddon), as scientific journalism, and as energy, climate and waste journalism (pp. 14 f.).

These results show that *qualities of a good journalist are similar in Germany and Australia*. In both countries, a good journalist is made by training on the job; the industry assesses journalism education as merely “nice to have”. Environmental journalism is not a subject at university or journalism school. It is an issue which underlies the personal interest of a journalist, and his/her personal interest will affect his/her knowledge about it (see Table 10).

The fact that the socialisation of journalists is very similar in Germany and Australia leads to the assumption that the socialisation of journalists is not a factor of influence for the climate change coverage studied in this research, but it could explain differences in the style of reporting.

Table 10: Subject sphere: German and Australian journalists and their socialisation

Aspects of journalists and their socialisation	Germany	Australia
Acceptance of journalism studies	Low	Low
Acceptance of training on the job	High	High
Existence of environmental journalism as a part of education	Low	Low

3.4.3. German and Australian journalists and their self-concept

Examining journalists’ socialisation in both countries, another central issue is their self-concept as a journalist. Do they see themselves as advocates for a certain public sphere, as a supervisory authority or as a critic?

Weischenberg et al. (2006) asked 1,536 *German journalists* working in all kinds of media from 1 February to 25 April 2005 via telephone interviews on their self-concept (p. 349). The authors defined 15 statements which need to be ranked by the participating journalists in terms of their role and the relevance of action (Weischenberg et al. 2006, p. 355). Relevance of action stands for the connection between the self-concept of a journalist and the possibility to put it into practice (Weischenberg et al. 2006, p. 355). The results of Weisch-

enberg et al. (2006) – representing only the two options of highest agreement: “I agree entirely” and “I agree mainly” – show four central issues of self-concept and relevance of action (p. 356).

Looking at the top-5 answers, most of the participating journalists described their self-concept in terms of “informing the public neutrally and precisely” (88.6 per cent), followed by “explaining and conveying complex issues” (79.4 per cent), “informing the audience as soon as possible” (74.1 per cent), “representing reality as it is” (73.8 per cent) and “concentrating on news which is of relevance for most of the audience” (60.2 per cent) (Weischenberg et al. 2006, p. 356).

Analysing these five topics regarding their possibility to put these self-concepts into action, the ranking changes: “inform the audience as soon as possible” (79.1 per cent) is ranked first, followed by “inform the public neutrally and precisely” (76.4 per cent), “explain and convey complex issues” (75.1 per cent) “concentrate on news which are of relevance for most of the audience” (74.4 per cent) and “represent reality as it is” (67.2 per cent) (Weischenberg et al. 2006, p. 356).

Weischenberg et al. (2006), therefore, conclude that the self-concept of journalists in Germany is being an informer for their audience, and the results of the relevance of action analysis shows that the participating journalists can also put this claim into action (p. 355). Only the aspect “representing reality as it is” appears to not be very practical: only two-thirds of the participating journalists stated that it is easy to put this principle into action, whereas all other aspects were agreed to by 75 per cent (Weischenberg et al. 2006, p. 356).

Looking at the answers with the least approval in terms of the self-concept of journalists, “influencing and putting specific topics on the political agenda” (13.8 per cent) is named least frequently, followed by “presenting specific viewpoints to the audience” (19.4 per cent) (Weischenberg et al. 2006, p. 356). However, only 39.4 per cent are able to put the self-concept relating to “influencing and putting specific topics on the political agenda” into action (Weischenberg et al. 2006, p. 356). These results might mean that journalists are asked, for example by the owners of the medium they work for, to put influential material into their coverage. As many as 66.8 per cent were able to put their self-concept in terms of “presenting the audience with specific viewpoints” into action (Weischenberg et al. 2006, p. 356).

Reviewing the statements made by Weischenberg et al. (2006), Lünenborg and Berghofer (2010) analysed the self-concept of political journalists with the support of online analyses in November/December 2009 using the databases “Zimpel” and “MEDIAtlas” to identify

the sample of journalists (pp. 5 f.). A total of 916 journalists answered the questions (Lünenborg and Berghofer 2010, p. 7). The results produced by Lünenborg and Berghofer (2010) support Weischenberg et al.'s (2006) findings about the journalistic role of informing and mediating: 95.5 per cent of the participating journalists argue that they “explain and convey complex issues” and 82.7 per cent say “inform the public neutrally and precisely” (p. 38). Lünenborg and Berghofer (2010) identified this result as a change in comparison to previous studies, which ranked these two aspects the other way around (p. 37). Moreover, 79.3 per cent stated that they “represent reality as it is” and 62.2 per cent wanted to “inform the audience as soon as possible” (Lünenborg and Berghofer 2010, p. 38).

The two aspects that met with least approval – “influencing and putting one’s own topics on the political agenda” and “presenting one’s own viewpoints to the audience” – reveal a higher percentage among political journalists than among journalists in all fields: 24.6 per cent said that “influencing and putting one’s own topics on the political agenda” and 32.5 per cent stated that “presenting one’s own viewpoints to the audience” is part of their self-concept (Lünenborg and Berghofer 2010, p. 39).

These results correspond with those of Weischenberg et al. (2006). But the ranking of the top answers is different. For Lünenborg and Berghofer (2010) political journalists see themselves much more as explainers and mediators, i. e. in a more audience-centric role; the demands of the audience are considered by political journalists (p. 37). In addition, the research shows that part of the self-concept of political journalists is to “offer criticism regarding abuses” (74.4 per cent) (Lünenborg and Berghofer 2010, p. 39). Especially in the context of this research, it is highly relevant that Lünenborg and Berghofer (2010) discovered that 48.2 per cent of political journalists stated that they are mainly concerned with environmental politics (p. 36); and climate change is one aspect of environmental politics. So, in relation to interpreting the results of this research, the research by Lünenborg and Berghofer (2010) shows that climate change, on the one hand, might be explained and criticised by political journalist and can, thus, include the journalists’ opinions. On the other hand, climate change could be discussed in a political context.

To find research on the self-concept of journalists from an Australian perspective is difficult. Hanusch (2008) explains that the last survey on this issue, which was carried out by Henningham, was in 1998, 16 years before the survey he carried out himself (p. 8).

Hanusch (2008) also deals with the self-concept of *Australian journalists*. As explained in the previous chapter, the basis for his survey was the aforementioned framework developed by Hanitzsch et al. (2011), which includes three constituents of journalism culture which are

the functions of journalism in society (institutional roles), the notions of reality and what constitutes evidence (epistemologies) and how journalists deal with ethical problems (ethical ideologies) which, in addition, are further divided into seven principle dimensions (p. 5). Hanusch (2008) provides deeper insight into the results of the Australian survey.

The central finding about the institutional roles are that journalists “...merely report events rather than get involved in them” (Hanusch 2008, p. 6). Their role is to be a detached observer and that they do not set the political agenda or are advocates for social change (Hanusch 2008, p. 6). “To provide citizens with the information they need to make political decisions” is ranked as “extremely important” or “very important” by 79.0 per cent of the participating journalists, “to act as watchdog of the government” is stated by 76.0 per cent, “to be an absolutely detached observer” by 71.4 per cent, “to act as watchdog of business elites” by 67.0 per cent, and “to provide the audience with the information that is most interesting” by 61.6 per cent of the Australian journalists (Hanusch 2008, p. 6). The latter aspect shows – as does the study by Lünenborg and Berghofer (2010) – that the demands of the audience are also of importance for Australian journalists. Hanusch (2008) approves this aspect when saying that Australian journalists favoured a citizen-oriented approach and even increasingly see readers as consumers of their coverage (p. 6). This is why Australian coverage might be somewhat more audience-centric than German coverage, which could also be due to the fact that Australia has an increasingly tabloid newspaper market (see, for example, Papandrea 2013).

Another important finding is the role of watchdogs, either monitoring the government or business elites (see Hanusch 2008, p. 6). Neither aspect is part of the results in the German surveys. Although Lünenborg and Berghofer (2010) talk about “offer criticism regarding abuses” (p. 39), the Australian term of a “watchdog” is much stronger and seems to be a much more investigative approach to journalism, with a focus of the political and economic elites in the country. This approach might result in more news coverage with own opinion, due to a greater aspiration to fulfil the role of a watchdog.

Besides Hanusch’s (2008) survey, there was also research by Rodrigues (2008), who analysed the self-concept of journalists in the Australian state of Victoria. This research took place between July 2007 and February 2008 and adopted a two-step approach, combining quantitative and qualitative methods (Rodrigues 2008, p. 114). A total of 600 survey questionnaires were sent to journalists in metropolitan, suburban and regional print, radio and television newsrooms in Victoria, of which 83 were returned (Rodrigues 2008, p. 114). In addition, 12 in-depth interviews were conducted to supplement the information gathered

through the surveys (Rodrigues 2008, p. 114). The focus of the project was journalists' views about a broad range of issues, including journalism ethics (Rodrigues 2008, p. 116).

The results produced by Rodrigues (2008) are comparable to those found by Hanusch (2008): Almost all respondents state that it is "extremely important" for the media to "investigate claims and statements" (88 per cent), to "provide analysis of complex problems" (77 per cent), and to "get information to the public quickly" (75 per cent) (Rodrigues 2008, p. 118). Ranked fourth and in the mid-range of "extremely important" are to "provide analysis of international developments" (63 per cent) (Rodrigues 2008, p. 118), an answer which supports the audience-centric approach of Australian media which Hanusch (2008) also identified. However, the fifth answer was to "motivate ordinary people to get involved in public discussion of important issues" (52 per cent) (Rodrigues 2008, p. 118). This is an intervention of the media and might draw the attention of the public to, for example, a low-value issue just in order to mobilise them in a certain direction.

Rodrigues (2008) also asked the participating journalists about the circumstances in which illegal practices are accepted (p. 117). Looking at the five most important answers, 63 per cent of the sample of journalists says that "using confidential business/government documents without authorisation" is "justified on occasion" when it relates to an important story (Rodrigues 2008, p. 117). 49 per cent say the same about "badgering unwilling information/sources to get the story", 46 per cent refer to "making use of personal documents without permission" and "using re-creations or dramatisations of news by actors" and 41 per cent feel the same about "using hidden camera or microphones" (p. 117). So, illegal practices are occasionally used in Australia and do not seem to be unethical or labelled as "bad journalism". These practices are either good or bad for the public discourse. A good aspect of the acceptance of illegal practices is that the public gets access to secret information, in terms of climate change, for example, to the agenda of the fossil fuel lobby. A bad aspect is that the substance of the coverage could be principally questioned. So, knowledge about journalists engaging in illegal practices might irritate the public.

To answer the question about the self-concept of journalists, the answer after this part of the chapter is: as an informer and criticiser for Germany and being a watchdog and analyst for Australia (see Table 11).

These results of the journalist's self-concept lead to a new question for this work, that is to say: how could this self-concept be identified in climate change coverage? Therefore, two types of articles are differentiated, the informing and the commenting articles.

Informing articles are factual articles. They include facts and data, cite people as well as scientific results, drafts of legislation and opinion polls. An example for an informing article from the German media is “Die entscheidenden zwei Grad” from *Süddeutsche Zeitung*. It says in terms of climate change: “Effektiver Klimaschutz, betonte Johann Wackerbauer vom Institut für Wirtschaftsforschung, verursachen Kosten von einem Prozent des Bruttoinlandsprodukts. Die Kosten, die ein Klimawandel verursacht, liegen bei fünf, manche schätzen sogar 20 Prozent [Effective climate protection, emphasized Johann Wackerbauer from the Institute for Economic Research, costs one percent of gross domestic product. The costs caused by climate change are five percent, some even estimate 20 percent]” (*Süddeutsche Zeitung*, 30.11.2009). This example cites a scientist and mentions data.

The *Sydney Morning Herald* publishes “Getting it right on climate change” and writes: “As expected, [the climate change conference in] Bali has become a lightning rod for a range of differing perspectives, from those who accept the scientific consensus on the dangers of climate change and want urgent action to those who question the science and prefer vague interaction. European nations and some developing countries have been pressing for developed countries to agree to a 25 to 40 per cent cut in carbon emissions by 2020. The United States, Japan and Canada oppose such efforts” (*Sydney Morning Herald*, 13.12.2007). This article gives information about the discussion and, thus, about the different perspectives worldwide on climate change during the Bali conference.

Commenting articles are opinion articles that use narratives. So, feature stories which reveal the life of a particular person belong to this category. Also, public relations material, such as interviews, speeches or articles in which the authors are political leaders or experts expressing their own personal opinion are examples of commenting articles. These articles are often written in the first person, using “I” or “we”.

An example for a commenting article in Germany is from Norbert Röttgen, Bundesumweltminister at the time of publishing. He writes in *Frankfurter Allgemeine Zeitung*: “In Kopenhagen geht es ums Ganze: Schaffen wir den Durchbruch für den internationalen Klimaschutz – oder behalten die Kassandra's recht und der Klimaschutz wird auf die lange Bank geschoben?” [Copenhagen is all about the whole picture: will we achieve a breakthrough for international climate protection - or will the Cassandra's be right and climate protection be postponed?] (*Frankfurter Allgemeine Zeitung*, 2.12.2009). So, this article is written by a person with own political interests and he writes in first person using „we“.

For Australia, *The Age* writes about “Renaissance in the Valley”: “It’s early Monday morning and clouds of steam rising from the huge stacks over Loy Yang power station hang in

the spring sunshine. The scene below is not so peaceful. Earlier, environmental protesters have broken in and chained themselves to conveyor belts delivering coal to the plant. Removing them under the eye of cameras is slow work. The protesters' supporters wear orange T-shirts with the slogan 'I'm taking real action for climate change' emblazoned across the front" (The Age, 23.09.2007). This article tells a story, using narratives to create a picture in the readers' mind.

So, this work also looks at this reflection of the self-concept, coding all articles in terms of being informing or commenting.

Moreover, the findings of this chapter – that Germany's journalists are informer and criticiser and being a watchdog and analyst is important for Australian journalists – results in the expectation that journalists in Germany would produce mainly informing coverage, whereas Australian journalists would write in a commenting style.

Table 11: Professional sphere: comparison of the self-concept of German and Australian journalists

Aspects of the self-concept of journalists	Germany	Australia
Provide citizens with information	neutrally and precisely	to make political decisions
Take an audience-centric approach	consider the demands of the audience and present their own viewpoints	provide the audience with the information that is most interesting for them
Influence/guide readers with their coverage	least approval in terms of the self-concept	important aspect of journalism
Use illegal practices, such as dramatisation, hidden cameras/microphones etc.	no information available	occasionally used
The task of the journalist	informer and criticiser	watchdog and analyst

3.4.4. German and Australian journalists and news values

News values are an important journalistic tool, helping journalists to identify what is important and what is not newsworthy. To identify the most important news values of our time, in *Germany*, Ruhrmann and Göbbel (2007) ask in an online survey 43 journalists of all kind of media (3 chief editors, 7 managing editors, 4 news managers, 18 managing editors, 1 editor on duty and 9 editors without leadership role) about current news values, the changes in news values, the control authority of news values, and the most relevant news topics (p. 39).

To identify these two aspects, Ruhrmann and Göbbel (2007) offered all participants a list of 21 scientifically identified news values including their definitions; each criterion could be ranked from 1 (not important) to 5 (very important) (p. 40). To identify the most relevant news topics, the participants in the study are, moreover, asked an open question: to name the topics which they feel are of most importance in their newsroom (Ruhrmann and Göbbel 2007, p. 45).

So, Ruhrmann and Göbbel (2007) identified 1. the purview, which means the total number of people who are directly affected by an event, with an average of 4.3; 2. German participation, which includes either coverage with German participation or without German participation, with an average of 4.0; 3. negative consequences/damage/failure, which concentrates on the negative aspects of an issue, with an average of 3.8; 4. surprise, which is an event that confounds all expectations, with an average of 3.8; 5. conflict/differences of opinion, which stands for the representation of verbal or written controversies, with an average of 3.7, and 6. positive consequences/benefits/success, which includes positive events that are explicitly named, with an average of 3.7 (p. 41). Further news values are prominence (3.3), proximity to Germany (3.3), personalisation (3.3), establishment of issues (3.3), visualisation (3.2), status of the scene of the event (3.1), status of the country where event takes place (3.1), violence/aggression (3.1), and demonstration (3.1) (Ruhrmann and Göbbel 2007, p. 41). The existence of pictures and, thus, a picture as a 'lead' for news (3.0), the political proximity to Germany (3.0), the visual demonstration of emotions (2.9) the economic proximity to Germany (2.8), the influence of an institution or a person (2.7), the cultural proximity to Germany (2.6), and sexual/erotic aspects (1.5), which was of less importance for the participants in the survey (Ruhrmann and Göbbel 2007, pp. 41 f.). Göbbel's und Ruhrmann's (2007) analysis, consequently, confirms the classic news values of purview, conflict/differences of opinion and damage vs. benefits (p. 42).

Referring to changes in news values, the criteria "existence of pictures", "visualisation", "visual demonstration of emotions", "purview", "prominence", "personalisation" and "German participation" are seen as of greater importance (Ruhrmann and Göbbel 2007, p. 43).

Badenschier and Wormer (2012) investigate news values in the context of science journalism of which climate science is a part. They therefore use a quantitative as well as a qualitative method: a content analysis and guided interviews analysing the German nationwide quality daily newspapers *Frankfurter Allgemeine Zeitung*, *Süddeutsche Zeitung* and *Die Welt* (Badenschier and Wormer 2012, p. 74). For the guided one-hour interviews, Badenschier and Wormer (2012) include the editor responsible for the science sections in each of the selected

newspapers (p. 74). The content analysis of the selected newspapers is completed in a randomly selected week in the first half of 2009; each article is scanned completely “...because a former study clearly indicated that a remarkable amount of science coverage can be found outside the science section”, using the “50+ percent scientific content” rule (Badenschier and Wormer 2012, p. 74). Finally, Badenschier and Wormer (2012) classify 192 articles as science journalism coverage (*Frankfurter Allgemeine Zeitung*: 31, *Süddeutsche Zeitung*: 59, *Die Welt*: 82) (pp. 74 f.).

Badenschier and Wormer (2012) started their research by creating a draft catalogue of news factors for science coverage, using the ideas about news factoring in science coverage published by Ruhrmann (1990/1997) (Badenschier and Wormer 2012, p. 70). The existing news factors were extended for science coverage, for example, “proximity” became “scientific proximity” (Badenschier and Wormer 2012, p. 71). Badenschier and Wormer (2012) identified 29 news values, resulting in a draft catalogue of factors (pp. 72 f.).

After the interviews and the content analysis, Badenschier and Wormer (2012) reduced the number of news values relevant to scientific communication to 14: “Astonishment”, “Political relevance”, “Composition”, “Range (number of affected people)”, “Controversy”, “Reference to elite persons”, “Economic relevance”, “Relevance to recipients/society”, “Graphical material”, “Scientific relevance”, “Intention”, “Actuality (Trigger)”, “Personalisation”, and “Unexpectedness”, all of which should “...help science journalists to pick the ‘right’ story...” (p. 79). The authors summarised their findings, writing that classical news values are relevant in science journalism and that the perspective of the general audience is of increasing importance for the selection (Badenschier and Wormer 2012, p. 80), a result that is discussed in the chapter about the self-concept of journalists.

Finding studies about news values in *Australian media* is difficult. The keywords “news values” and “Australia” in the period between 2007 and 2011, when this research took place, just lead to news values in the context of special issues, such as the representation of obesity, suicide or of Sudanese migrants in the media. News values in the context of content analysis are not available. It seems that news values are just a niche issue for researchers in Australia. Does this mean that, in Australia, news values are not developed? Or are they based on fixed journalistic rules that journalists learn during their education and do not question or extend?

Robie (2008) is the only researcher who analysed the literature about news values generally and examined their historical development, not explicitly for Australia, but for various regions in the Pacific. In his four-world model, Australia is part of the first world, together with New Zealand, Canada, European nations, and the US (Robie 2008, p. 105). Robie

(2008) defined the following news values for the first world: 1. timeliness: news is now; 2. proximity: news is near; 3. personality: news is prominent or includes interesting people including politicians, royalty, sports heroes and heroines, hip hop artists and movie stars; 4. unusual, odd events: news is quirky, weird, bizarre oddities outside the norm; 5. human interest; 6. conflict; and 7. disaster (p. 17). And “‘objectivity’ is espoused as a dominant ideal for First World media...” (Robie 2008, p. 15).

The study which is cited in all current research on Australian news values (see, for example, Robie 2008, Caple and Bednarek 2013) was done by Masterton (1998). So, unfortunately, there seem to be no other specific research on this issue in an Australian context.

Masterton (1998) asked why some information is more newsworthy than other information (p. 86). So, he sent more than 2,500 copies of a questionnaire in English, French, Spanish and Russian to decision-making journalists working at newspaper agencies and in broadcast newsrooms in 151 countries around the world as well as to journalism schools, both academic and based on training on the job (Masterton 1998, p. 89). He received replies to 11 per cent of all questionnaires sent and these came from 69 countries (Masterton 1998, p. 90). All respondents coded a list of 14 defined news values with “agree” (scored 2 points), “agree in part” (scored 1 point), “disagree in part” (scored minus 1 point), and “disagree” (scored minus 2 points) (Masterton 1998, p. 91). Dividing the total points scored by each news value by the number of respondents resulted in the “level of acceptance” (Masterton 1998, p. 91).

Masterton (1998) states that the most important news values identified in his research are: “consequence” (importance/impact), with a level of acceptance of 1.75, “proximity” (nearness), with a level of acceptance of 1.42, “conflict” (disagreement), with a level of acceptance of 1.42, “human interest” (stories about people), with a level of acceptance of 1.41, “novelty/unusualness” (bizarre/the rare), with a level of acceptance of 1.34, and “prominence” (about prominent people), with a level of acceptance of 1.26 (p. 91).

Comparing Masterton’s (1998) results with the list made by Robie (2008) reveals no major differences, even though Masterton’s (1998) study is an international one. “Personality” (Robie 2008) corresponds with “Prominence” (Masterton 1998), “proximity”, “unusual”, “human interest” and “conflict” are identified by Masterton (1998) and Robie (2008) as well. “Disaster” (Robie 2008) could be associated with “conflict” (Masterton 1998). Only “timeliness” (Robie 2008) is not equivalent to Masterton’s (1998) “consequence”, which means that the news values differ only slightly. So, there seems to be a general set of news values which are used throughout the world and to which Australia corresponds.

Due to the differences in news values research, it is very difficult to assess this aspect of journalists' socialisation. A noteworthy aspect of German news values is that also positive events are considered to be newsworthy, an aspect which is not mentioned in Australia. The Australian news values "timeliness" and "human interest" does not appear in the list of Germany's 21 scientifically identified news values (Ruhrmann and Göbbel (2007)). The latter aspect is a sign that Australians are interested in people stories or as Masterton (1998) put it: "...people want to know about other people, even if they are not important people" (p. 97). Instead, Germany refers to "the purview", which includes not only one, but a number of people affected by an event. This could suggest a preference for representing positive or negative events, not just the consequences for a single person. All other aspects are comparable: "German participation" with the Australian news values "proximity", the German "surprise" is similar to the Australian "unusual odd events" and the German "negative consequences/damage/failure" with the Australian news values of conflict" and "disaster".

A summary of all news values can be found in Table 12.

Table 12: Professional sphere: comparison of German and Australian news values

Aspects of news values	Germany	Australia
Purview, participation/relevance, (economic, political, scientific) proximity, range	Yes	Yes
Negative consequences, damage, failure, disaster	Yes	Yes
Surprise, unusual, odd events, unexpectedness, astonishment	Yes	Yes
Conflict, differences	Yes	Yes
Positive consequences, benefits, success	Yes	No
Timeliness, actuality	Yes	Yes
Personality	No	Yes
Human interest	No	Yes
Composition	Yes	No
Reference to elite nations	Yes	No

Summarising Chapter 3.4, it appears that *journalists in Germany and Australia have similar preconditions*. They need to prove themselves in the newsroom after their study or traineeship until they are accepted as a "good" journalist. Especially when they want to specialise in a field, such as climate change, they have to learn by doing and broaden their horizons in this field of interest on their own.

Differences in journalist's socialisation can be found in the definition of their role: German journalists want to be informers and criticisers, whereas Australian journalists tend to be analysers and watchdogs. For the climate change coverage in German newspapers, on the one hand, this could mean that journalists are more neutral than those writing for Australian newspapers. On the other hand, Australian newspapers help their audiences to understand complex issues, while German journalists see their main role as to inform. These findings correspond with the findings about the self-concept of a journalist – informer and criticiser versus watchdog and analyst. It could be measured in the examination of the climate change coverage in this research as an appearance of two types of writing styles: German journalists inform readers about facts and criticising misuse of polls, scientific results or drafts of drafts of legislation. Australian journalists comment on climate change coverage using statements made by the political and economic elite in the country as a basis for critical analysis and introduce their own experiences to make issues related to climate change more accessible to their readers.

3.5. Climate change coverage: the newspapers investigated

This chapter provides a closer look at the organisational structure and the political background of the four newspapers which are the basis for this research.

A discussion about the chosen newspapers is necessary because the different owners, the political orientation of a newspaper and circulation are factors of influence, which could also be represented in the news coverage of climate change. So, the newspapers are part of the “institutional sphere”.

The newspapers used for the research were chosen based on two requirements. The first is that they have the highest circulation in each country. This is an important aspect, as they influence public opinion on a broad scale. Because this research was intended to identify how different quality newspapers represent climate change, the second requirement is that all basic newspapers should have high journalistic standards. This is why tabloid newspapers are not considered.

Based on these requirements, the following newspapers are the basis for this research: For Germany, the report of the Bundesverband Deutscher Zeitungsverleger e. V. [Federal Association of Newspaper Publishers] says that the newspapers with the biggest circulation are *Sueddeutsche Zeitung* (428,266 copies) and *Frankfurter Allgemeine Zeitung* (363,620 copies) (2010). For Australia, *The Sydney Morning Herald* (207,013 copies) and *The Age* (197,500 copies) are examined (Audit Bureau of Circulations 2010).

In the following the four newspapers are introduced in terms of the ownership of the newspapers and their political orientation based on the literature. From the literature review of the four newspapers, it is noticeable that from 2007 to 2011, German as well as Australian researchers seemed not to have been interested in studying the general political direction of newspapers. This is why the literature review about the four newspapers is very general.

3.5.1. *Süddeutsche Zeitung*

Süddeutsche Verlag, the publisher of *Süddeutsche Zeitung*, is owned by a family of publishers from Munich as well as Südwestdeutsche Medien-Holding (Süddeutsche Verlag 2011). As stated in their mission statement, Süddeutsche Verlag (2011) considers itself to be independent of political parties and ideologies and has the central claim to provide information as well as freedom of opinion and a liberal and tolerant attitude. *Süddeutsche Zeitung* has a column called “Wissen” in which climate change is represented alongside topics such as archaeology, psychology and astronautics; regular climate change specials are not part of the media plan (Süddeutsche Verlag 2011).

Eilders (2002), who analysed the political positions of five German quality newspapers from 1994 to 1998 including *Süddeutsche Zeitung* as well as *Frankfurter Allgemeine Zeitung* (the latter is discussed in the next section), provided the basis for the following examinations of these newspapers (p. 34). This is why her findings are presented first.

Focusing on editorials, which “...indicate the editorial stance of a media outlet” (p. 33), Eilders (2002) codes the whole article using 45 defined issue categories with five conflict dimensions, including “economic wealth and distribution”, “institutional and individual autonomy”, “cultural identity”, “societal integration”, and “external security” (pp. 34 f.). A total of 8,717 editorials were read and 15,890 issues of the five newspapers were reviewed (Eilders 2002, p. 35).

Concentrating on *Süddeutsche Zeitung*, Eilders (2002) identified the newspaper as taking a centre-left position in relation to political issues (p. 41). Accordingly, most issue dimensions are evaluated as left by *Süddeutsche Zeitung*, especially “control of new technology versus acceptance of risk”, “participation versus representation”, and “cultural identity versus integration” (Eilders 2002, p. 43). Nevertheless, in conflict situations, in particular those which refer to tax and economy issues, the coverage is rather conservative (Eilders 2002, p. 43).

Lüter (2004) used Eilders’ (2002) data to examine editorial positions in the comments of German quality newspapers. He wrote that *Süddeutsche Zeitung* has a left-liberal orientation (Lüter 2004, p. 181) with a highly diagnostic approach to issues but does not put criticism

and explanations at the centre of its coverage (p. 185). The newspaper mainly supports the German Green Party (Lüter 2004, p. 180), which is an important information for this research. So, *Süddeutsche Zeitung* might be expected to be strongly pro-mitigating climate change. Lüter (2004), moreover, analysed the “positioning” of all newspapers in terms of directive editorial comment. However, the “positioning” of *Süddeutsche Zeitung* was, at 64.7 per cent, the lowest on this dimension of all the newspapers studied (Lüter 2004, p. 188). Thus, the “positioning” of *Süddeutsche Zeitung* is below average (Lüter 2004, p. 188). This “positioning” and the highly diagnostic approach to issues confirms the description of the socialisation of German journalists who see themselves as informers and criticisers (see Chapter 3.4.3).

3.5.2. *Frankfurter Allgemeine Zeitung*

The shareholders and editors of *Frankfurter Allgemeine Zeitung* are the FAZIT-Stiftung and the four publishers of *Frankfurter Allgemeine Zeitung* are Berthold Kohler (for politics), Jürgen Kaube (for the arts section), Holger Steltzner (for economic issues) and Werner D’Inka (for the *Frankfurter Allgemeine Zeitung*, Rhein-Main region) (FAZ 2015). The founders of *Frankfurter Allgemeine Zeitung*, mainly Erich Welter, decided that the editorial and entrepreneurial independence of the newspaper could best be guaranteed with the support of a non-profit institution as a majority shareholder (FAZ 2015).

Eilders’ (2002) analysis of editorials in *Frankfurter Allgemeine Zeitung* identified this newspaper as taking a rather conservative position in relation to political issues (p. 41). This can also be seen when she reviewed the issue dimensions: *Frankfurter Allgemeine Zeitung* only assesses “supranationalism versus sovereignty”, “cooperation versus conflict” and “centralism versus autonomy” as left (p. 43). Comparing all five newspapers she analysed, Eilders (2002) stated that: “...liberal and conservative papers displayed surprisingly corresponding positions on some issues while they strongly disagree on others” (p. 48).

Frankfurter Allgemeine Zeitung and *Süddeutsche Zeitung* mostly disagree on the issue dimensions „cosmopolitanism versus ethnocentrism“ and „cultural identity versus integration“ (Eilders 2002, p. 42) which both discuss relationships with foreign countries and culturally different groups (Eilders 2002, p. 54). Neither issue dimension is of interest for a discussion about climate change. This is why this difference will not result in different climate change coverage. “Cooperation versus conflict” and “supranationalism versus sovereignty” are the two issue dimensions that both newspapers mostly agree about (Eilders 2002, p. 42). The first dimension is about the East-West or North-West conflicts, the second discusses the activities of important organisations, such as the UN, NATO and the EU (Eilders 2002,

p. 56). This latter issue dimension could be of importance for the results of this research, because all institutions have a stake in the climate change discussion. Due to a very small difference of 0.03 (1.00 means absolutely left, 3.00 means absolutely right) between the two newspapers, there might be no difference in coverage. However, Eilders (2002) also examines the mean position for some policies (p. 44). This is why the environmental and energy policies, representing an ecological position, are compared with labour and employment as well as economic policies, representing the economic position. *Frankfurter Allgemeine Zeitung* clearly takes a right position (environmental policy: 2.29, energy policy: 2.58, labour and employment policy: 2.62, and economic policy also 2.62) (Eilders 2002, p. 44). *Süddeutsche Zeitung* positions itself more to the left in terms of its ecological position (environmental policy: 1.49, energy policy: 1.58), but only slightly in terms of its economic position (labour and employment policy: 2.11 and economic policy 2.21) (Eilders 2002, p. 44). This further supports the assumption that *Süddeutsche Zeitung* takes a stronger approach to encouraging climate change mitigation, and this is even stronger than that of *Frankfurter Allgemeine Zeitung*.

Lüter (2004) wrote that *Frankfurter Allgemeine Zeitung* takes a highly diagnostic approach to issues, whereas *Süddeutsche Zeitung* does not put criticism and explanations at the centre of its coverage (p. 185). *Frankfurter Allgemeine Zeitung* mainly supports the CDU Party and has a very negative view of the PDS party (Lüter 2004, p. 180).

3.5.3. *The Age*

The Age, based in Melbourne, is 100 per cent owned by Fairfax Media Limited and 60 per cent of the Australians consume Fairfax Media Limited content. The total masthead readership per month of *The Age* is 3.4 million (Fairfax Media Limited 2014).

In his analysis of the Australian media system Rahkonen (2007) explains that *The Age* is a traditional quality paper with an audience at the highest socio-economic level including educated people and decision makers (p. 28). In addition, he speaks about the pursuit of quality by *The Age*, which is represented by its broad and liberal way of reporting and the fact that it employed three investigative journalists (Rahkonen 2007, p. 29).

3.5.4. *The Sydney Morning Herald*

The Sydney Morning Herald is also 100 per cent owned by Fairfax Media Limited and has 5.4 million total masthead readership per month. Thus, *The Sydney Morning Herald* has the

largest total masthead readership in Australia across print, web, mobile and tablet (Fairfax Media Limited 2014).

Rahkonen (2007) also describes *The Sydney Morning Herald* in his analysis of the Australian media system. He says that *The Sydney Morning Herald* – like *The Age* – reports liberally (Rahkonen 2007, p. 33) and also dedicates a strong socio-economic position to its audience (Rahkonen 2007, p. 29).

Johnston and Graham (2012) made a content analysis of the front section of the two broadsheets *The Australian* and *The Sydney Morning Herald* in April and May 2007 and 2009 and identified an increasingly narrative writing style (p. 521). This result, consequently, proves the assumption made in Chapters 3.4.3 and 3.4.4 that Australia's journalists (mainly) use a commenting writing style.

The authors coded a sample of 2,435 stories in 2007 and 2,565 stories in 2009 (Johnston and Graham 2012, p. 522) and conducted three semi-structured interviews with leading newspaper editors and journalists by phone which took about 45 minutes each (Johnston and Graham 2012, p. 523). The results for *The Sydney Morning Herald* show an increase in comment/column articles (2007: 1.5 per cent; 2009: 3.2 per cent) (Johnston and Graham 2012, p. 523). Narrative style decreased during the same period by about 10 per cent (2007: 22.2 per cent; 2009: 13.4 per cent) (Johnston and Graham 2012, p. 523).

Although, with *The Age* and *The Sydney Morning Herald*, Fairfax Media Limited is the owner of two quality newspapers with the highest circulation in Australia and are, therefore, quite powerful, this media group is apparently only of little interest to researchers. Further literature about this media group's newspapers is, therefore, not available.

In contrast, there are a number of articles about Rupert Murdoch's News Ltd. (see, for example, Thussu 2007, McKnight 2010). A reason for this fact might be that Rupert Murdoch as a person is of interest because he not only controls his global media empire, but also has a huge reputation within the broader media and communication sphere, for example, in politics (Arsenault and Castells 2008, p. 503). And he is self-promoting, appearing "...on the cover of almost every major western publication" (Arsenault and Castells 2008, p. 503). Therefore, the research on *The Age* and *The Sydney Morning Herald* is finished with these two short sections.

Looking at the findings about the German and Australian newspapers covered by this research, the results are not comparable. Due to the fact that Fairfax Media Limited, the media company behind *The Age* and *The Sydney Morning Herald*, was practically not examined by

researchers during the research period, there is no applicable information available. The available information about *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* is also not very detailed (see Table 13).

Table 13: Societal sphere: comparison of the newspapers in terms of climate change coverage

Germany		Australia	
Süddeutsche Zeitung	Frankfurter Allgemeine Zeitung	The Age	The Sydney Morning Herald
Centre-left/liberal (Eilders 2002, Lüter 2004)	Conservative (Eilders 2002)	Broad and liberal (Rahkonen 2007)	Liberal (Rahkonen 2007)
Highly diagnostic approach to issues to issues (Lüter 2004)	Highly diagnostic approach to issues (Lüter 2004)	Investigative journalists (Rahkonen 2007)	No information available
Not putting criticism and explanations at the centre of its coverage (Lüter 2004)	Not putting criticism and explanations at the centre of its coverage (Lüter 2004)	No information available	No information available
Pro German Green Party/contra CSU (Lüter 2004)	Pro CDU Party/contra PDS party (Lüter 2004)	No information available	No information available
Only little directive comment. ("positioning") (Lüter 2004)	Only little directive comment. ("positioning") (Lüter 2004)	No information available	No information available
No information available	No information available	Audience at the highest socio-economic level (Rahkonen 2007)	Audience at the highest socio-economic level (Rahkonen 2007)

3.6. Summary of theoretical findings

Existing studies on climate change coverage in Germany and Australia have recognisable deficits: 1. Large-scale studies cannot go into detail, 2. statements about extreme weather always refer to the amount, not the quality of the coverage, and 3. the examination of climate change coverage mainly refers to the analysis of coverage in the context of climate conferences, and not in the context of events representing social and economical consequences (environmental disaster) or political and medial consequences (election campaign). This research aims on closing these gaps.

In doing so, this research will, first, look at the *political influence* on German and Australian climate change coverage (see, for example, Bechberger and Reiche 2004, Tilly 2007, Weidner 2008, Neuhoff 2010, Schäfer et al. 2012, Maurer 2011, Manne 2011, Bacon 2013). The literature shows that the influence of politics seems to be greater in Australia. The opinion of the current Australian Prime Minister and his/her party essentially dominates their involvement in climate change. This is why the assumption is that the climate change coverage during the 2007 Australian election was more diverse in the two Australian newspapers. German political parties, by contrast, do not have the chance to choose whether they would like to include climate change in their election programme. They have to, because climate change is securely established in the public discourse.

Second, this research considers the *influence of lobby groups* on German and Australian climate change coverage (see, for example, Walk 2011, Bülow 2010, CEO 2010, Griffiths et al. 2007, Mitchell 2012). The literature shows that, in both countries, these lobby/interest groups mainly come from the energy/fossil fuel industry. The assumption is, therefore, that a critical tone in terms of climate change appears in the news coverage of climate change or even a climate-change-sceptical viewpoint as well as that climate-change-sceptical institutions have a say, because this could be caused by lobby groups.

Thirdly, the analysis of the literature about *energy supply, natural resources for energy generation, and climate* has shown that Germany is less dependent from fossil fuels than Australia due to a broader diversification of energy sources and that climate change already influences the lifestyle of Australia's inhabitants whereas the German public is not as affected (see, for example, AGE 2016, AER 2007-2013, BGR 2013, Energy in Australia 2013, Germanwatch 2007, Australian Bureau of Meteorology and CSIRO 2014). This leads to the expectation that the two examined Australian newspapers would have a higher number of reports about the effects of climate change and it is likely to include more calls for action in terms of climate change. On the other hand, German climate change coverage could be more diverse.

Fourthly, the *influence from inside the media company* was discussed in this chapter (see, for example, Cox 2006, Donk et al. 2012, Josephi 2011). A central finding of this examination is that Australian journalists seem to have more freedom when writing their coverage. However, the power of media outlets and the influence of media owners put this advantage into perspective. For the coverage which is studied in this research, these facts could result in a broader variety of opinions, perspectives, and aspects related to climate change in German newspapers, whereas the climate change coverage in the Australian newspapers is similar within each medium.

Fifthly, the *attitude of journalists to their work* is different in the two countries: German journalists tend to concentrate on “political information” whereas Australian journalists look for “interesting information” (see, for example, Hanitzsch et al. 2011, Hanusch 2008). Because climate change is a political topic, this result gives rise to the question whether climate change is rather represented in a political context in German newspapers.

Sixthly, the *literature about the qualities of a good journalist, i. e. their socialisation*, shows similar preferences (see, for example, Harnischmacher 2010, Hirst 2010). This is why the assumption is that the socialisation of journalists is not a factor which can explain differences in climate change coverage.

Seventhly, the *self-concept as a journalist* is described as “informer and criticiser” for Germany and “being a watchdog and analyst” for Australia (see, for example, Weischenberg et al. 2006, Lünenborg and Berghofer 2010, Hanusch 2008, Hanitzsch et al. 2011, Rodrigues 2008). These results about the self-concept of a journalist could be measurable in the examination of the climate change coverage in terms of two types of writing styles: German journalists inform the public about facts and criticise abuses using polls, scientific results or drafts of legislation. Australian journalists comment in their climate change coverage on statements by the political and economic elite of the country as a basis for a critical analysis and introduce their own experiences to make climate change accessible to their readers.

Eighthly, the *findings about news values* are not sufficiently informative (see, for example, Ruhrmann and Göbbel 2007, Badenschier and Wormer 2012, Robie 2008, Masterton 1998). The news values in the two countries seem to be quite similar.

Ninthly, the *newspapers which are examined in this research* are discussed (see, for example, Süddeutsche Verlag 2011, Eilders 2002, Lüter 2004, FAZ 2015, Rahkonen 2007, Johnston and Graham 2012); however, the literature about these newspapers is too different to provide comparable results.

4. Conclusions from theory

The findings of research on framing climate change as well as of the literature based on Bräuer and Wolling's "Extended Sphere Model" (2014) introduces a number of aspects relevant to the representation of climate change in newspapers and about the profession of journalists as authors of climate change coverage. For the development of hypotheses and sub research questions, these aspects are set in the context of the two main events included in this research – the two elections in Germany and Australia as well as the environmental disasters in the two countries. The central goal is to identify frames and frame sub-dimensions of climate change found in the literature, deduced from theory (see Chapters 2 and 3) and inductively added while testing the code book.

The theoretical findings from Chapters 2 and 3 show that, basically, both countries identify climate change as a problem and call for action, even though without demanding concrete activities. Besides this consensus, there are, however, a number of differences between German and Australian climate change media coverage.

In this research, these differences in coverage are examined in the context of an election and an environmental disaster. In the following, the theoretical findings from Chapters 2 and 3 are, therefore, associated with these events. As a result, hypotheses as well as sub research questions are defined, comparing the two countries, the two events and the time before and after the event itself.

4.1. Comparisons between the countries

The theoretical findings related to German and Australian climate change coverage, which are of importance for the comparison between the two countries, focus especially on the following three topics: climate change politics, lobby groups and journalistic norms.

That *politics* has a major influence on the representation of climate change in German as well as Australian media is a central finding of the theoretical discussion. The Chancellor and the Prime Minister, respectively introduced the topic in both countries in the 1970s/1980s and made it a political issue, however, with different effects as the literature analysed (see Chapter 3) shows. In Australia, the climate change discussion and the responsibility for climate change are strongly connected with the opinion of the Prime Minister and his/her party. They influence the intensity of media appearance by supporting the issue of climate change, or by not doing so (see, for example, Hamilton 2001, Crowley 2007, Taylor

2014). Thus, they also influence the extent of public discourse about climate change. In Germany, by contrast, the literature review shows that climate change is now firmly established in the political as well as in the public discourse; it is part of German society's value system (Weidner 2008, p. 24 f). Weidner (2008) refers to 20 years of positive path dependency by the German government, regardless of the dominant parties (pp. 10 f.) and says that the country's climate change policy is one of the most effective worldwide (Weidner 2008, p. xii).

These different conditions are also reflected in election programmes of the two countries. In Germany, climate change is part of every party programme. In Australia, climate change became, for the first time after nearly two decades, an issue in the 2007 election, using the slogan "the greatest moral challenge of our time" (Suter 2010, p. 310). This clear statement about the importance of tackling climate change leads to the assumption that the climate change coverage during the election campaign in Australia not only defines, but also explains the issue, using frame sub-dimensions of causes and effects, and refers to action designed to mitigate climate change, which can be identified by the frame sub-dimensions of the frame element "treatment recommendation". Due to the fact that climate change is not a new topic in elections in Germany, the political parties only have to say that climate change is part of their programme. German media coverage of climate change, therefore, tends to be rather generic, including just a problem definition without going too much into detail.

Hypothesis 1: Australia's climate change coverage is dominated by frames of causes and effects as well as of action. Germany's climate change coverage is unspecific and restricted to defining the problem.

These findings resulting in hypothesis 1 also give a hint to one of the dominant authors of climate change coverage in the two countries: the findings show that Australia's politicians have stronger influence whereas Germany's politicians have less influence on media attention to climate change.

Hypothesis 2: Politicians in Australia have a greater stake in the representation of the national climate change discussion than those in Germany. They are more often mentioned in the country's newspapers than German politicians in German newspapers.

Examination of the influence of *lobby groups* on German and Australian climate change coverage illustrates the fact that lobbyists from various industries and organisations are part of the political arena. Via politicians, the lobby group's input also finds its way into the media. Due to the fact that the literature about lobby groups is insufficient, a hypothesis about lobbyism is not considered. However, the findings about lobbyism must be connected

with another outcome of the literature review, i. e. the fact that there is a difference in terms of the way journalists deal with sources. The Australian climate change coverage is affected by balance-as-bias news reporting; Australia's journalists aim to give different viewpoints on a topic equal coverage (see Bacon 2013). This journalistic norm creates a lot of scope for lobbying – an issue which is also reflected by the public that "...believed there was a lack of balanced, unbiased information available..." (Climate Institute of Australia 2010, p. 10). As a consequence, there are more critical voices and climate-change-sceptical viewpoints in Australian newspapers: McGaurr et al. (2013) state that the "uncertainty" frame is predominant (89 per cent), signifying that Australia's news media make an effort to achieve balanced reporting, but without considering dominant scientific opinions (p. 27).

In Germany, this phenomenon of giving critics and sceptics a say only rarely exists, because the literature shows that there is a consensus that climate change is man-made: Arlt and Wolling (2012) say that the "uncertainty discourse" is rarely mentioned (p. 291).

Hypothesis 3: In Australia, the representation of climate-change-sceptic viewpoints is a normal aspect of climate change coverage. German newspapers rarely give space to such sceptical voices.

The literature about *journalists* does not identify major differences. German and Australian journalists face the same advantages and disadvantages when starting their working career and editors in both nations claim that you learn to be a journalist by training on the job (see, for example, Harnischmacher 2010, Hirst 2010). This latter finding, however, shows that the influence of media outlets and media owners on the representation of climate change could be considerable. They, for example, decide about the usage or non-usage of certain news values within a newsroom (see, for example, Robie 2008, Caple and Bednarek 2013, Masterton 1998) and they influence the representation of issues in newspapers (see, for example Cox 2006, Boykoff and Boykoff 2004). From discussions of these issues it is clear that coverage is not always objective but can be influenced by a number of interests.

This seems to be especially the case in Australia as the literature about the influence on journalists from inside the media company shows. Donk et al. (2012) explain that there is a high concentration in media ownership in Australia with a lot of influence across all genres and a great deal of power in terms of spin (p. 511). And Josephi (2011) talks about "...few democratic traits due to the influence of media owners" (Josephi 2011, p. 21).

Another difference between Germany and Australia is that the media owners build huge conglomerates across all media genres in Australia – basically there are two huge conglomerates, that is to say Fairfax Limited and News Corp (see, for example, Lidberg 2018) –

whereas there are more media groups in Germany. This might be expected to lead to a broader variety of opinions in German climate change coverage.

Hypothesis 4a: German newspapers represent a wide variety of perspectives on climate change. The diversity of frame sub-dimensions is high. In Australia, the variety of perspectives on climate change is low.

Hypothesis 4b: The variety of actors in German newspapers is higher than the variety of actors in Australian newspapers.

The literature shows that the self-understanding as a journalist is represented as an “informer and criticiser” in Germany and “being a watchdog and analyst” in Australia (see, for example, Weischenberg et al. 2006, Lünenborg and Berghofer 2010, Hanusch 2008, Hanitzsch et al. 2011, Rodrigues 2008). These results might be related to two types of writing styles: German journalists, on the one hand, might primarily critically inform the public about facts, using polls, scientific results or drafts of legislation. On the other hand, Australian journalists comment on climate change using statements by the political and economic elite and their own experiences to make climate change accessible to their readers.

Hypothesis 5: German journalists use an informing writing style for climate change coverage, while Australian journalists use a commenting one.

The literature about the *public’s attitude to climate change* shows that Germany as well as Australia “say others are responsible” and name “politicians” as accountable for the issue. The German public refers to the national government, and expects national politicians to act against climate change (Eurobarometer 2014, p. 28). Also the Australian public refers to national politicians; the Climate Institute of Australia (2010) found out: 85 per cent of the Australians said that they would support a major political party that has a detailed plan to tackle climate change in the country (p. 22).

Hypothesis 6: German as well as Australian climate change coverage demands that national politicians tackle climate change.

A question which arises from this hypothesis, but refers to the comparison between the two events, makes the following assumption: an environmental disaster makes national action necessary. So, domestic politicians must take action. In contrast, in an election campaign, politicians might demand international action.

Sub research question 1: Does the response to an environmental disaster emphasise national activities, whereas the discourse in an election emphasises international activities?

The literature also reveals a strong difference in how the public in the two countries experience the impact of climate change on their everyday life: the German public “feel affected by the consequences of climate change – now or in future – to a limited extent (Umweltbewusstsein in Deutschland 2014, p. 45), whereas the Australian public feel “strongly affected” Climate Institute of Australia (2010, p. 22ff).

Hypothesis 7: German climate change coverage contains few frame sub-dimensions of the effects of climate change. In Australia, the media widely represents the effects of climate change.

Another question which refers to the comparison of the two events is based on the assumption that an environmental disaster leads to discussions about the effects of climate change.

Sub research question 2: Does “causal interpretation (the effects of climate change)” appear more often during the environmental disaster than during the election?

Because sub research questions 1 and 2 compare the two events, these sub research questions are answered in Chapter 6.2.2, in which the comparison between the two events is made.

4.2. Comparisons between the two events

The comparison between the two events refers to the findings about energy supply, natural resources for energy generation, and climate as well as the political aspects.

The literature about *energy supply, natural resources for energy generation, and climate* shows that 1. Extreme weather has already impacted the lifestyle of Australia’s inhabitants – hurricanes, heatwaves, floods and drought already exist; in Germany, the impact is still not that visible (Germanwatch 2007, p. 4, and Australian Bureau of Meteorology and CSIRO 2014, p. 3), and 2. Germany increasingly uses renewable energy and, in general, has a broader diversification of energy sources (AGEB 2016). Australia mainly relies on coal, a fact, which has led to a coal industry with massive industrial power and a powerful lobby in the national government (AER 2007-2012).

So, there are two aspects which might influence the perception of climate change in Australia: first, Australia’s climate has always included hurricanes, heatwaves, floods and drought. Thus, the Australian nation might be more used to environmental disasters, although the number of these environmental disasters is increasing. And, second, the coal industry might have the power to push the connection between environmental disasters and climate change into the background, so that it is only rarely represented in media coverage.

Good (2008) already identified this phenomenon of “protecting the economy” in her study about the framing of climate change in Canadian, American, and international newspapers, explaining that topics such as extreme weather, floods, forest fires, and hurricanes/storms are ignored to protect the economy (p. 246).

Hypothesis 8: Whereas the newspaper coverage around the political election comprises requests for action, the media informs the public about the consequences of climate change during the time of the environmental disaster.

From this hypothesis another sub research question arises related to the writing style of climate change coverage. This sub research question refers to the assumption that an environmental disaster leads to coverage that presents data and facts about the issue, whereas an election provides room for commenting pieces.

Sub research question 3: Is the newspaper coverage of climate change around the political election commenting and is it informing during the time of the environmental disaster?

In the discussion about the differences between the two events, the senders of climate change coverage also play an important role – and here especially politicians and journalists. Politicians in Germany as well as in Australia are under pressure: the German public demands climate change action (see, for example, Tilly 2007, Eurobarometer 2014, Climate Institute of Australia 2010). Politicians, therefore have to provide success messages, showing that they do act against climate change. Looking at the journalists, in Germany, they say that their role is informing and mediating about news events (see, for example, Lünenborg and Berghofer 2010 and Weischenberg et al. 2006). “To provide citizens with the information they need to make political decisions” is ranked as “extremely important” or “very important” by Australian journalists (Hanusch 2008, p. 6). These findings from the state of research result in the following assumptions: 1. Politicians increase their public relations activities during the election period, and 2. an environmental disaster encourages journalists to inform the public broadly about climate change issues. Therefore, the following sub research question about the actors arises.

Sub research question 4: Are political actors dominant during the time of the political election, whereas other actors get more attention during the time of the environmental disaster?

4.3. Comparisons before/after the event

The comparison before/after the two events mainly refers to the literature review of political and climate aspects, to lobby groups as well as to the theoretical findings about framing.

The theoretical findings about the dominance of climate change in the context of the 2007 election campaign in Australia also relate to the timeframe before and after the election. The assumption is that, during the election campaign, the framing of climate change is – as defined in Chapter 4.1 – more focused on causes and effects as well as action to present climate change as an important topic which must be tackled.

Hypothesis 9: Australia's climate change coverage before the election was strongly dominated by frames of causes and effects as well as of action. After the election, the frames became more diverse.

Whether these changes can be observed also during the German political election remains an open question. No hypothesis can be stated based on the existing literature.

Sub research question 5: Which of the defined frames from hypothesis 9 were dominant before and after the German political election?

Awareness that climate change was again part of the election campaign – after nearly two decades – might increasingly spur lobby groups into action that want to avert the victory of Kevin Rudd's Labor Party. Alliances between lobbyists and governmental representatives created pressure: lobbyists have established working groups and networks to represent their interests (see, for example, Kozák 2010, Walk 2011). So, one might expect more critical voices before the election, whereas afterwards fewer sceptics might have a say because the effort of lobby groups to convince voters about the non-existence of climate change might decline.

Hypothesis 10: Critical and sceptical voices accompanied the 2007 election before the Australian election day. After the election, the prominence of critical and sceptical voices was clearly reduced.

In relation to the Australian media coverage, McGaurr et al. (2013) stated that the “disaster/implicit risk” frame (96 per cent), which refers to the consequences of climate change – most of them life-threatening, such as floods, water and food shortages – is predominant (p. 27). This “disaster/implicit risk” frame might be expected to appear increasingly during the Queensland flood as evidence of a life-threatening environmental disaster.

The negative results of climate change also dominate in the German media (Arlt and Wolling 2012, p. 292). The assumption is that after an environmental disaster, such as the Oder flooding, these negative connotations related to climate change are strengthened. “Causal interpretation (effects of climate change)” with a strong negative connotation might be expected to dominate the coverage.

Hypothesis 11a: After the Queensland floods, the Australian newspaper coverage of climate change concentrated on the frame sub-dimensions “Causal interpretation (effects of climate change)” in general.

Hypothesis 11b After the Oder floods, the German newspaper coverage of climate change concentrated especially on negative effects relating to the frame sub-dimensions “Causal interpretation (effects of climate change)”.

Because there were no findings published concerning differences in the framing of climate change between the four newspapers, the following two sub research questions were stated.

Sub research question 6: Was there a difference in framing of climate change in the four newspapers examined?

Sub research question 7: Which actors were covered in the context of climate change in the four newspapers examined?

5. Methodology

The quantitative analysis in this study concentrates on two German (*Süddeutsche Zeitung*/*Frankfurter Allgemeine Zeitung*) as well as two Australian (*The Age*/*The Sydney Morning Herald*) national quality newspapers which were studied in terms of their climate change coverage. This climate change coverage relates to two events: an election as well as an environmental disaster.

The articles focusing on political change were evaluated six months before/after:

- 27 September 2009 (Germany): the election victory of the CDU/FDP coalition
- 3 December 2007 (Australia): the election victory of the Australian Labor Party

The context of the environmental disaster was examined six months before/after:

- May 2010 (Germany): the Oder floods
- December 2010 (Australia): the Queensland floods

The goal of this thesis was to find out whether these two events resulted in changes in framing climate change in German and Australian quality newspapers.

The keywords used to identify the articles for the this work were “Klimawandel”/”climate change” and “Erderwärmung”/”global warming”. For the Australian articles the database *Ebsco Host Megafile Premier* was used, while for the German articles the online archives of the newspapers *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* provided the data. For the analysis, all journalistic genres were considered, except letters to the editor. As the online archives of the newspapers were used, the research only focused on textual aspects, not on pictures. The content of the text as a whole was decisive, and not just parts of the coverage, such as only the headline.

A total of 9,850 articles were found in these four time periods, of which 1,012 articles were analysed (see Table 14).

Table 14: *Composition of the articles analysed*

	Number of articles found	Sample in per cent	Final number of articles analysed*
German election	1,906	Every 10 th article	200 (85 before/115 after)
Australian election	4,324	Every 10 th article	420 (202 before/218 after)
German environmental disaster	1,433	Every 10 th article	175 (112 before/63 after)
Australian environmental disaster	2,187	Every 10 th article	217 (112 before/105 after)
Total	9,850		1,012

* The articles used for the analysis were counted, starting with the first article in every month. From this monthly retrieval of data, variations in the sample emerged.

The chosen quality newspapers have the highest circulation rate in their countries: *Süddeutsche Zeitung* (428,266 copies) (in the following tables the abbreviation “SZ” is used) and *Frankfurter Allgemeine Zeitung* (363,620 copies) (in the following tables the abbreviation “FAZ” is used) (Bundesverband Deutscher Zeitungsverleger e. V. 2010), *The Sydney Morning Herald* (207,013 copies) (in the following tables the abbreviation “SMH” is used) and *The Age* (197,500 copies) (Audit Bureau of Circulations 2010). Thus, the assumption was that the arguments in the articles in these four quality newspapers – in this case about climate change/global warming – would have high acceptance in society and refer to the dominant ideologies, hegemonic structures and the popular culture of each country (see, for example, Reese 1990, Cottle 2000, Hermes and Dahlgren 2006, as discussed in Chapter 2). The representation of environmental issues in the articles, thus, reflects the dominant messages in terms of environmental issues in each of the two countries.

5.1. Developing the code book

The code book consists of two parts, which include first stage and second stage coding (see Appendix A).

The first stage coding was designed to make sure that the newspaper could be identified and each article classified. Thus, it included the headline of each coded article, the keyword used, the date of publication, as well as the name of the newspaper. Moreover, all articles were first examined in terms of their journalistic form of expression. The following two dimensions of journalistic form of expression were defined: commenting and informing.

Commenting articles are articles that use narratives. So, feature stories which show the life of a certain person as well as public relations material, such as interviews, speeches or articles in which authors are political leaders or member of the church and, thus, show their personal opinion are commenting. In addition, these articles are often written in the first person (“I” and “we”).

Informing articles are factual articles. These include facts and data, cite scientific results, drafts of legislation, opinion polls and adopt a neutral news style.

The second stage coding identified frame sub-dimensions in the four German and Australian quality newspaper coverage using Entman’s (1993) frame dimensions “Problem definition”, “Causal interpretation”, “Moral evaluation”, and “Treatment recommendation” (p. 52) as a basis. Considering the findings of other researchers from the literature review of framing (see Chapter 3), it became apparent that the aspect “causal interpretation” had to be divided into two parts for more explicit results. So, “causal interpretation” was divided into “causal interpretations” (which focus on “causes of climate change”, for example, human activities as a cause of climate change), and “causal interpretations” (which refer to “the effects of climate change”, for example, changes in biodiversity). Because the literature review has also shown that the “moral evaluation” was about responsible behaviour in terms of climate change – or could even be assessed as a sub-item of responsibility – this term was changed into “responsibility”. The frame sub-dimensions of responsibility refer to the integrity of humans, the economy/industry and countries.

Entman’s (1993) four frame elements thus provide the basic raster for the second stage coding of German and Australian climate change reporting, but they are augmented by several sub-dimensions found in the literature review (see Chapter 3) as well as with the support of an inductive analysis while testing the code book. During the test of the code book, some of these ex ante defined sub-dimensions were extended. For example, in “Causal interpretation (effects of climate change)”, the sub-dimension “Effects on humans: diseases, epidemics, death, war etc.” in its first definition did not include “death” and “war”. Moreover, in “Responsibility” the item “including tax” in the sub-dimension “Financial/economic aspects (including tax) should not influence activities against climate change” was added. Moreover, additional frame sub-dimensions were found inductively while testing the code book. Looking for example at the frame element “Causal Interpretation (causes of climate change)”, the frame sub-dimensions “Destruction of forests”, “Emission of greenhouse gases”, and “Natural causes” were found in the literature. The frames and frame sub-dimensions “Human activities, in general”, “Population increase”, and “Denying that humans are a possible cause” were added during the test of the code book.

The result of the literature review as well as the findings from inductive analysis while testing the code book are summarised in Table 15 to Table 19 using “*problem definition*”, “*causal interpretation – causes of climate change*”, “*causal interpretation – effects of climate change*”, “*responsibility*” and “*treatment recommendation*” as main categories for all identified frame sub-dimensions.

Looking a bit closer at the five frame elements, the concept of “*problem definition*” identifies how the issues “climate change” and “global warming” are represented in the selected print media. This dimension encompasses sub-dimensions which can be used to examine the basic views of the coverage in terms of “Klimawandel”/“climate change” and “Erderwärmung”/“global warming”.

“Problem definition” is the frame element which, at least, must appear clearly in each article. This means that one of the sub-dimensions of this category must be written down in the same or similar words to those in Table 15. Just the appearance of the words “Klimawandel”/“climate change” or “Erderwärmung”/“global warming” is not a “problem definition”. All articles in the sample which did not fulfil the requirement that a “problem definition” appears were replaced by a new one. Articles which appeared twice in the sample were also replaced. This description of the coding process also shows that the coding unit is the article as a whole, not just a headline or a paragraph.

The code units are “0” and “1”. Code “0” is used if the sub-dimension is not mentioned in the article, code “1” if the sub-dimension appears in the selected coverage. It is possible to code more than one sub-dimension in each article. When code “1” is selected, the key player of the sub-dimension – i. e. the actor behind the statement – must also be identified and coded “1”. Due to the fact that, in some articles, more than one key player discussed the issue “Klimawandel”/“climate change” or “Erderwärmung”/“global warming”, it was also possible to code more than one sub-dimension of “problem definition” with “1” in an article. The frame sub-dimensions are, however, not connected with a specific actor. The coding regulations described in this paragraph also apply to all of the following frame sub-dimensions.

As already stated: the frame element “*causal interpretation*” from Entman (1993) is divided into two parts. The frame element with the amendment “*causes of climate change*” concentrates on reasons why “Klimawandel”/“climate change” or “Erderwärmung”/“global warming” is an issue in today’s public discourse and, thus, also in the media coverage (see Table 16). “Natural causes” is one frame sub-dimension of this frame element. The second aspect of “causal interpretation” deals with the “*effects of climate change*”. It asks the question:

What are the consequences of climate change? Based on the foregone collection of sub-dimensions, four key aspects which are affected by climate change were chosen: nature, weather, humans, and the economy (see Table 17).

Entman's (1993) frame element "moral evaluation" is renamed "*responsibility*" because most of the literature found about framing connects this frame element to "responsibility" (as discussed in Chapter 3). In this frame element, statements about the "responsibility" for "Klimawandel"/"climate change" or "Erderwärmung"/"global warming" are included, ranging from "Everybody is responsible" to "Everybody is discharged from responsibility" (see Table 18).

"*Treatment recommendation*" has two major tasks: First, it demands action. The readers of the coverage are asked to be active in the context of "Klimawandel"/"climate change" or "Erderwärmung"/"global warming". Second, it offers excuses for no activity. This could be, for example, the fact, that "the economy comes first" or that "there is no problem". Then, no treatment is required (see Table 19).

In the following, Table 15 to Table 19 summarise all found frame sub-dimensions and gives examples. The frame sub-dimensions which were found while testing the code book are shaded in white, while those which were found deductively are shaded in grey.

Table 15: *Frame sub-dimensions: problem definition*

Problem definition		
Sub-dimension	Explanation	Example(s)
Climate change exists and is a problem.	The sub-dimension Climate change exists and is a problem shows that “climate change” and “global warming” are issues which cause challenges. One could also consider establishing, for example, a climate change commission.	“Australia’s major cities are lagging behind those in Europe, South Africa and the United States in rolling out programs to <u>tackle climate change</u> , a new global report reveals.” (The Age, 12.06.2012) “Insbesondere die <u>Folgen des Klimawandels</u> und eingeschleppte Arten sind nach IUCN-Angaben nur schwer rückgängig zu machen.” (FAZ, 19.06.2012)
Climate change is a subject of controversial debate.	The sub-dimension Climate change is a subject of controversial debate asks whether “climate change” and “global warming” really exist. In doing so, it gives the climate-change-sceptical position publicity as a different scientific opinion about “climate change” and “global warming”.	“One rank-and-file Liberal member was given rousing applause when he said global warming was a natural phenomenon and the theory that human activity had caused it was ‘absolute rubbish’. ...The <u>grassroots debate highlights the huge task</u> Mr Turnbull faces as he tries to bring his party with him on amendments to the Government’s carbon pollution reduction scheme.” (The Age, 08.11.2009)
Climate change is not fully examined.	The sub-dimension Climate change is not fully examined states, for example, that there is no clear evidence about the existence and the consequences of climate change.	“The problem with <u>climate change is that because it is a concept, a theory, a belief</u> , it provides a blank piece of paper upon with <u>every voter can write their own political message</u> .” (The Age, 28.08.2010)
Climate change exists, but is not a problem.	The sub-dimension Climate change exists, but is not a problem says that there is, for example, an increase in temperature or a drought, but it either does not assess these natural irregularities as consequences of “climate change” and “global warming” or accepted the consequences – either negative or positive ones – as not a problem/a positive aspect.	“With the threat of climate change, farmers’ <u>ability to grow food in dry conditions could become a billion-dollar knowledge export industry</u> , according to a leading science writer.” (The Age, 06.08.2007)
Climate change does not exist.	The sub-dimension Climate change does not exist identifies the consequences but does not connect these consequences with “climate change” or “global warming”. Thus, climate change is not a problem, and/or its existence is questioned.	[Cardinal George] Pell, on the other hand, clings to the fashionable right-wing credo that <u>global warming is fraud</u> .” (SMH, 19.03.2011)

Table 16: *Frame sub-dimensions: causal interpretation (causes of climate change)*

Causal interpretation (causes of climate change)		
Sub-dimension	Explanation	Example(s)
Human activities, in general	The sub-dimension Human activities (in general) shows that “climate change” and “global warming” are generally the result of human activities – they are anthropogenic.	<p>“In seinem kürzlich veröffentlichten Buch <u>“Waking the Giant – How a Changing Climate Triggers Earthquakes, Tsunamis, and Volcanos”</u> beschwört der Professor vom University College London ein Szenario herauf, in dem der <u>Mensch durch die ungebremsste Emission von Treibhausgasen schlafende Monster aufweckt.</u>” (FR, 04.07.2012)</p> <p>“Der Raubbau an den Wäldern geht weiter, die Ozeane sind überfischt, die <u>Anzeichen für einen vom Menschen verursachten Klimawandel verstetigen sich</u>, die Artenvielfalt schwindet.” (FAZ, 22.06.2012)</p>
Population increase	The sub-dimension Population increase sees world population growth and its consequences (i. e. the need for more meat) as responsible for “climate change” and “global warming”.	<p>“Its report, “Climate Change and Food Systems”, estimated food production was responsible for between 19 and 29 per cent of mankind’s total greenhouse emissions, far above UN estimates of 14 per cent based on a narrower definition of farming... ‘The world’s agricultural systems face an uphill <u>struggle in feeding a projected nine to ten billion people by 2050. Climate change introduces a significant hurdle in this struggle,</u>’ it said. The world population is now just above seven billion.” (The Age, 31.10.2012)</p>
Denying that humans are a possible cause	The sub-dimension Denying that humans are a possible cause argues that the world is too big. So human beings are too small to be able to have an impact on “climate change” and “global warming”.	<p>“There may be an argument for Australia to price carbon, but it can’t be to arrest global warming or slow climate change – <u>we’re simply too small an emitter of greenhouse gases for moderate cuts to make any measurable difference.</u>” (The Age, 12.04.2011)</p>
Destruction of forests	The sub-dimension Destruction of forests says that “climate change” and “global warming” is a result of a decreasing area of forests and tree population.	<p>“Die Zeitungen des Landes sind voll mit Analysen und Berichten zu Klimawandel, <u>den Folgen unkontrollierten Abholzens ganzer Wälder</u> und dem prekären Gleichgewicht der Ökosysteme.” (FAZ, 19.10.2009)</p>
Emission of greenhouse gases	The sub-dimension Emission of greenhouse gases says that “climate change” and “global warming” are results of greenhouse gas emissions or an increasing amount of car and air traffic.	<p>“Mark Dreyfus, parliamentary secretary for climate change and energy efficiency said, <u>commercial buildings accounted for more than 10 per cent of national greenhouse gas emissions.</u>” (The Age, 23.02.2011)</p>

Causal interpretation (causes of climate change)		
Sub-dimension	Explanation	Example(s)
Natural reason	The sub-dimension Natural causes says that “climate change” and “global warming” is a consequence of natural cycles, such as solar activity or similar.	“But a group of physicists with strong links to the Republican White House cherry-picked one section of a Hansen graph and used it to misleadingly claim in Washington that it showed the <u>warming was solely due to the sun</u> .” (The Age, 13.11.2009)

Table 17: *Frame sub-dimensions: causal interpretation (effects of climate change)*

Causal Interpretation (effects of climate change)		
Sub-dimension	Explanation	Example(s)
Effects on nature: changes in biodiversity – negative consequences	The sub-dimension Effects on nature: changes in biodiversity – negative consequences refers to changes in animal and plant species based on “climate change” and “global warming”. The changes are explicitly rated as negative.	“Voters are alarmed about the <u>loss of this nation’s living heritage and the impact of burning forests on climate change</u> will have to vote Green in 2007.” (SMH, 24.07.2012)
Effects on nature: changes in biodiversity – positive consequences	The sub-dimension Effects on nature: changes in biodiversity – positive consequences refers to changes in animal and plant species based on “climate change” and “global warming”. This change has a positive connotation, for example in terms of economic growth.	“Der Biologe arbeitet in Bad Zwischenahn im “Park der Gärten” und kann täglich beobachten, wie <u>die Erderwärmung Spuren hinterlässt: Kamelien trotzen plötzlich mit Leichtigkeit dem Winter, mediterrane Kräuter fühlen sich pudelwohl, und der Lotus öffnet seine Blüten</u> . Auch die Rhododendren haben ihren Rhythmus verändert.” (FAZ, 17.06.2010)
Effects on nature: sea-level rise	The sub-dimension Effects on nature: sea-level rise includes all causal effects of “climate change” and “global warming” regarding sea-level rise.	“The Intergovernmental Panel on Climate Change <u>predicts a sea-level rise of up to 59 centimetres over the next century</u> , a level that would inundate most of the Maldives’ inhabited atolls.” (SMH, 07.01.2012)
Effects on nature: forest fires	The sub-dimension Effects on nature: forest fires includes all causal effects of “climate change” and “global warming” regarding forest fires.	“He was asked seven key questions, <u>including whether climate change was a contributing factor to the extreme fire-weather conditions on Black Saturday</u> , and how often such catastrophic conditions might occur over the next 10-40 years.” (The Age, 14.08.2010)

Causal Interpretation (effects of climate change)		
Sub-dimension	Explanation	Example(s)
Effects on nature: erosion	The sub-dimension Effects on nature: erosion includes all causal effects of “climate change” and “global warming” regarding erosion.	“Now there are warnings that <u>with climate change triggering higher seas and fiercer, more frequent storms, we may soon need to buffer Sydney’s beaches from erosion by ‘nourishing’ them with sand mined from the sea floor.</u> ” (SMH, 08.01.2008)
Effects on nature: results of warming (floods, drought, ice melt etc.)	The sub-dimension Effects on nature: results of warming includes issues such as floods, drought, ice melt etc. as a result of climate change.	“ <u>Urban flooding is expected to become a bigger problem with climate change, with more intense rain events expected to occur more frequently, despite expectations of lower annual rainfall totals in many parts of Australia.</u> ” (The Age, 15.01.2011)
Effects on the weather: increase in temperature	The sub-dimension Effects on the weather: increase in temperature is the cause of heatwaves.	“ <u>Global warming of about 4.5 degrees was expected this century if emissions continued to rise at current levels, though warming could be as low as 3 degrees or as high as 7 degrees.</u> ” (The Age, 17.08.2010)
Effects on the weather: more extreme weather	The sub-dimension Effects on the weather: more extreme weather explains the view that “climate change” and “global warming” lead to an increase in extreme weather events.	“Dr Rajendra Pachauri, the chairman of the United Nations’ Intergovernmental Panel on Climate Change (IPCC), said a new report on extreme weather events to be released later this year will support <u>previous findings natural disasters are increasing in frequency and intensity around the world.</u> ” (SMH, 17.05.2011)
Effects on humans: diseases, epidemics, death, war etc.	The sub-dimension Effects on humans: diseases, epidemics etc. states that “climate change” and “global warming” could have negative effects on human health and can cause death.	“Professor McMichael’s paper states that the greatest recurring health risk over past millennia <u>has been from food shortages, mostly caused by drying and drought.</u> Warming also leads to an <u>increase in infectious diseases</u> as a result of better growth conditions for bacteria and the proliferation of mosquitoes.” (The Age, 31.01.2012)
Effects on humans: climate change refugees/suffering of the poor	The sub-dimension Effects on humans: climate change refugees/suffering of the poor show that “climate change” and “global warming” causes people to flee due to drought, floods or similar environmental disasters.	“The President of what could be the first country in the world lost to <u>climate change has urged Australia to prepare for a mass wave of climate refugees seeking a new place to live.</u> The Maldivian President, Mohamed Nasheed, said his government was considering Australia as a possible new home if the tiny archipelago disappears beneath rising seas.” (SMH, 07.01.2012)

Causal Interpretation (effects of climate change)		
Sub-dimension	Explanation	Example(s)
Effects on humans: future generations will be climate change victims	The sub-dimension Effects on humans: future generations will be climate change victims identifies future generations as victims of the effects of “climate change” and “global warming”.	“‘The time for doubt has passed’, Mr Ban told the meeting of 150 nations he had convened in New York on Monday, the biggest conference on <u>climate change</u> yet. ‘What we do about it will define us, our era, and ultimately <u>the global legacy we leave for future generations</u> .’” (SMH, 26.09.2007)
Effects on humans: water/food supply	The sub-dimension Effects on humans: water/food supply shows that climate change has negative consequences on water as well as food supply and, thus, could result in famine-hit countries.	“The Cities as Water Supply Catchments research programme at Monash University is looking at alternative water systems to counter pressure such as drought, population growth and <u>climate change, which are threatening traditional water supplies’ ability to meet urban needs</u> .” (SMH, 12.10.2010)
Effects on the economy: huge effects if we do nothing, less negative effects if we combat climate change	The sub-dimension Effects on the economy: huge negative effects if we do nothing, less negative effects if we combat climate change says that the economy has advantages from tackling “climate change” as well as “global warming”.	“Zu diesem Schluss kommt auch Claudia Kemfert, die für das Deutsche Institut für Wirtschaftsforschung DIW eine Abschätzung vorgelegt hat: <u>Bis zu 800 Milliarden Euro muss Deutschland demnach bis 2050 für die Folgen eines ungebremsen Klimawandels einplanen. Um das Zwei-Prozent-Ziel einzuhalten, wären nur 500 Milliarden Euro fällig.</u> Für die Bundesrepublik fallen die Kosten eher moderat aus, weil Mitteleuropa vom Klimawandel weitaus weniger betroffen sein wird als der Süden des Kontinents und Afrika.” (SZ, 17.05.2010)
Effects on the economy: economic benefits	The sub-dimension Effects on the economy: economic benefits states that “climate change” as well as “global warming” have economic benefits.	“Gillard, in her Adelaide speech, took on the employment fears. She argued that failure to act on climate would cost jobs, through <u>climate change</u> itself and because <u>Australia would become less competitive in a lower carbon world. But if we acted, jobs would be created in cleaner energy</u> , while the nature of other jobs would be transformed.” (The Age, 18.03.2011)
Effects on the economy: economic problems including costs	The sub-dimension Effects on the economy: economic problems including costs means that “climate change” as well as “global warming” causes economic problems and it costs money.	“Nach den Berechnungen der Umweltökonomin könnte der <u>Klimawandel in den kommenden 50 Jahren durchschnittlich zu gesamtwirtschaftlichen Wachstumseinbußen von 0,5 Prozentpunkten pro Jahr führen.</u> ” (SZ, 17.05.2010)

Table 18: *Frame sub-dimensions: responsibility*

Responsibility		
Sub-dimension	Explanation	Example(s)
Everybody is responsible	The sub-dimension Everybody is responsible means that all human beings and their activities are responsible for “climate change” and “global warming”.	“The federal Environment Minister, Malcolm Turnbull, goes tow-to-toe in a debate on <u>climate change</u> with a 15-year-old. Turnbull is part of a discussion panel that includes a Baulkham Hills year 9 student, Alastair Wadlow, who set up Planet Patrol with his sisters Imogen and Freya to encourage children to care for the planet.” (SMH, 13.12.2010)
Everybody is discharged from responsibility	The sub-dimension Everybody is discharged from responsibility means that neither human beings nor their activities are responsible for “climate change” and “global warming”.	“The clear impression is that Asian-driven coal demand is a more powerful juggernaut than <u>climate change</u> . As one English delegate put it: ‘ <u>The Chinese don’t give a stuff about greenhouse emissions, and nor do I.</u> ’” (The Age, 14.11.2010)
Humans have moral deficits	The sub-dimension Humans have moral deficits says that human beings in industrial countries are responsible for “climate change” and “global warming” whereas developing countries have to deal with the consequences.	“A poll by the Lowy Institute has tracked the willingness of Australians to pay extra for electricity. <u>The number of people who refused to pay anything to tackle climate change has increased from 21 per cent in 2008 to 35 per cent in 2010.</u> ” (The Age, 05.09.2010)
Financial/economic aspects (including tax) should not influence activities against climate change	The sub-dimension Financial/economic aspects should not influence activities combating climate change shows that subsidies in monetary form should not play a role in the context of “climate change” and “global warming”.	“‘It wasn’t the science, the scientists, or the economics that <u>killed action on climate change</u> ,’ he wrote. ‘ <u>What was it? The answer is, the usual suspects: greed and cowardice.</u> If you want to <u>understand opposition to climate action follow the money.</u> ’” (The Age, 13.11.2010)
Developed countries are responsible	The sub-dimension Developed countries are responsible says that developed countries are mainly responsible for the increasing problems of “climate change” and “global warming”.	“Chinese Finance Minister Jin Renqing said his country supported the use of market-based emissions trading as a method of controlling climate change but <u>emphasised that China expected developed nations to carry the burden.</u> ‘ <u>Greenhouse gas is a serious challenge for us, but the source of most of the greenhouse gas produced came from developed countries.</u> ’ he said.” (The Age, 04.08.2007)

Table 19: *Frame sub-dimensions: treatment recommendation*

Treatment Recommendation		
Sub-dimension	Explanation	Example
Something must be done, in general	The sub-dimension Something must be done, in general does not name specific activities, but says that something must be done in the context “climate change” and “global warming”.	“Climate change is one of the single <u>big- gest challenges</u> facing development, and <u>we need to assume the moral responsibility to take action</u> on behalf of future generations, especially the poorest.” (The Age, 19.11.2012)
General reduction of greenhouse gases – national focus	The sub-dimension General reduction of greenhouse gases – national focus asks human beings in the own country for action to reduce the amount of greenhouse gases in their own country.	“As a gas target would be a logical next step for the <u>Brumby government</u> – given the bold commitments <u>it has already made on other fronts to tackle greenhouse emissions in its white paper on climate change.</u> ” (The Age, 04.10.2010)
General reduction of greenhouse gases – international focus	The sub-dimension General reduction of greenhouse gases – international focus asks human beings throughout the world for action to reduce the amount of greenhouse gases throughout the world.	“Bis zum Jahr 2050 müssten <u>die Industrieländer ihren Ausstoß an Treibhausgasen um 80 bis 90 Prozent verringern</u> ; nur dann könne ein <u>Klimawandel mit dramatischen Folgen verhindert werden.</u> ” (FAZ, 15.12.2009)
Demand climate change policy – national focus	The sub-dimension Demand climate change policy – national focus discusses the invention of special policies regarding “climate change” and “global warming” on a national basis.	“ <u>Promised before the 2006 election, the climate change white paper has been delayed amid internal confusion</u> while the state government waited on the design of a national carbon trading scheme.” (The Age, 16.07.2010)
Demand climate change policy – international focus	The sub-dimension Demand climate change policy – international focus discusses the invention of special policies regarding “climate change” and “global warming” on an international basis.	“Using a simple analogy, he said that although he did not expect his home to burn down, he had taken out insurance against such a disaster. <u>In the same way, Australia and the world need an insurance policy for climate change.</u> ” (The Age, 20.06.2011)
Demand more responsibility by the government/politicians	The sub-dimension Demand more responsibility by the government/ politicians demands action from the government as well as from ministers and other politicians in terms of climate change.	“Speaking in Canberra, the [Climate] institute’s Erwin Jackson said he hoped a <u>hung parliament that gave influence to the Greens and the independents could ensure more ‘accountability’ in climate change policy.</u> ” (The Age, 25.08.2010)
Replacing/displacing one energy source with another	The sub-dimension Replacing/displacing one energy source with another discusses for example whether the use of fossil fuels for energy consumption could be replaced by the use of nuclear power plants for generating energy.	““The growing realisation that the challenge of combating <u>global climate change will entail significant and substantive shifts in energy production</u> and use in the developed world has <u>stimulated a resurgence of reactor building and planning worldwide</u> ’, he said.” (SMH, 02.02.2008)

Treatment Recommendation		
Sub-dimension	Explanation	Example
Rewarding climate-friendly behaviour	The sub-dimension Rewarding climate-friendly behaviour says that the inhabitants must be recompensed for behaving in a climate-friendly way.	"Business customers can also <u>take advantage of the offer</u> [to switch from electric to solar hot water or heat pumps], which is a combination of <u>certificates, a discount from the manufacturer, and funding from an NSW State Government climate change fund.</u> " (SMH, 31.07.2007)
Something must be done, but this should not influence economic growth	The sub-dimension Something must be done but this should not influence economic growth supports all activities in the context of "climate change" and "global warming" which do not influence economic growth.	"Far from spending the next three years chatting about <u>whether to get serious about combating climate change, we need to debate our unquestioned commitment to unlimited economic growth.</u> " (SMH, 14.07.2010)
Economic aspects must be changed because of climate change (including greenwashing)	The sub-dimension Economic aspects must be changed because of climate change/global warming (including greenwashing) says that, for example, a new infrastructure is an investment in tackling "climate change"/"global warming". It also discusses aspects which show that an institution or company just wants to "green" its image.	"In Deutschland sieht es so aus, als habe zumindest Bundesumweltminister Sigmar Gabriel erkannt, wie sinnlos und abwegig der ewige Konflikt zwischen Ökonomie und Umweltschutz geworden ist. Es gilt in der Tat, <u>nun entschiedener die Effizienz- und Einsparpotentiale in der Energienutzung auszuschöpfen, anders haben Sonne, Wind und andere erneuerbare Ressourcen so schnell keine Chance, mehr als ein Nischendasein zu führen.</u> Und es gilt, diesen " <u>Leitmarkt Energietechnik</u> " mit aller Kraft sowohl für die heimischen Klimaschutzziele als auch für den Export zu nutzen." (SZ, 28.11.2008)
Nuclear energy helps to reduce emissions/fossil fuel quarrying	The sub-dimension Nuclear energy helps to reduce emissions/fossil fuel quarrying states that nuclear energy is a clean alternative to fossil fuels and/or helps to reduce carbon emissions.	" <u>Nuclear energy produces no carbon dioxide emissions</u> when operating." (SMH, 27.11.2010)
Use of renewable energy	The sub-dimension Use of renewable energy invites human beings to use renewable energy sources, such as wind, sun or water.	"Greenpeace, and many other environment groups, argue that the process cannot deliver emissions cuts in time to slow down <u>human-created global warming</u> , and that public investment in the experimental technology diverts resources from <u>other ways of reducing emissions, such as energy efficiency, solar, wind and wave power.</u> " (SMH, 06.05.2008)

Treatment Recommendation		
Sub-dimension	Explanation	Example
Reduction of using fossil fuels	The sub-dimension Reduction of using fossil fuels wants human beings to reduce the consumption of fossil fuels.	“Both <u>climate change</u> and peak oil force us to think about different kinds of cities that are <u>able to cope with less fossil fuels</u> ,” he says. ‘ <u>We’ve built our civilisation around the cheapness and easy available fossil fuels. That era is ending.</u> ’ (The Age, 19.09.2010)
Rebuilding the natural environment	The sub-dimension Rebuilding the natural environment explains the importance of a healthy natural environment and shows that activities are necessary to help nature to recover. This sub-dimension is about a fundamental change.	“‘The cheapest and most efficient way of slowing down <u>global warming</u> is to <u>protect and restore the forests</u> , particularly the tropical forests,’ the 77-year-old said.” (The Age, 10.06.2011)
Take measures to mitigate the effects of climate change	The sub-dimension Take measures to mitigate the effects of climate change is about establishing a risk management in the context of environmental disasters.	“ <u>Versicherungslösungen wollen Munich Re und andere im Rahmen der MCII auch für all jene kreieren</u> , die vom Klimawandel besonders betroffen sein werden: die Entwicklungsländer, die in den Dürre- oder Hochwasserzonen Afrikas und Asiens liegen.” (SZ, 27.11.2009)
Tips for preventing the effects of climate change	The sub-dimension Tips for preventing the effects of climate change is about practical hints which show the reader how he/she could help to tackle climate change and global warming.	“However, to <u>achieve the large reductions in climate change pollution</u> below 1990 levels being called for by scientists, Australia would <u>also need to cut its immigration intake and end land clearing</u> , the report said.” (SMH, 10.10.2007)
Increase in knowledge about climate change	The sub-dimension Increase in knowledge about climate change/global warming includes articles which demand climate change education or which have educational content that increases readers’ knowledge about “climate change” and “global warming”.	“Tackling the challenges of <u>climate change will require us all to understand</u> not just the science of climate change but also what options we have to respond to it and mitigate further change. ...We must be clear about what is happening now, and that <u>information must be available to everyone.</u> ” (The Age, 13.07.2010)
Scientific development	The sub-dimension Scientific development makes “climate change” and “global warming” a matter of scientific development. Articles in this sub-dimension say that scientists are invited to find or work on solutions for the consequences/challenges of “climate change” and “global warming”.	“The Prime Minister used the occasion to announce a new <u>climate change fund</u> – to be set up in 2011, to <u>pay for research into clean energy</u> , and also to help subsidise the power bills of the less well-off.” (SMH, 23.10. 2007)

Treatment Recommendation		
<i>Sub-dimension</i>	<i>Explanation</i>	<i>Example</i>
Smaller personal carbon footprint	The sub-dimension Smaller personal carbon footprint asks human beings to reduce their personal expenditure of energy.	"Jeder Deutsche hat im vergangenen Jahr <u>zwar noch 7,5 Tonnen umweltschädlichen Kohlenstoffdioxids (CO₂) freigesetzt. Damit leiteten die Deutschen jedoch eine Trendwende ein. Denn vor zehn Jahren waren es noch 8,0 Tonnen.</u> " (SZ, 13.12.2010)
Ask (the media) to stop publishing climate-change-sceptical positions	The sub-dimension Ask (the media) to stop publishing climate-change-sceptical positions argues that the climate-change-sceptical position, which is often picked up and published by the media for reasons of balance, but is also published as a public relations exercise by climate-change-sceptical scientists or institutions, and should be stopped.	"The existence of dissenting voices is a mark of democracy, but this does not mean that <u>balance in reporting scientific and policy debates is achieved by giving opposing sides equal weight when that 'balance' does not remotely resemble the weight of scientific support for human-caused climate change.</u> " (The Age, 29.03.2011)
No treatment required: the economy comes first	The sub-dimension No treatment required: the economy comes first claims that economic activities are more important than any activities combating "climate change" and "global warming".	" <u>Diese Länder [Schwellenländer] wollen von ihren Wachstumskonzepten nicht abrücken.</u> Internationale [Klima]Abmachungen, die sie in ihrer Entwicklung beschränken könnten, lehnen sie ab." (FAZ, 22.06.2012)
No treatment required: there is no problem	The sub-dimension No treatment required: there is not a problem ignores all the problems of "climate change" and "global warming" and does not ask for any activities.	"Fact 1. A mild warming about 0.5 degrees Celsius (well within previous natural temperature variations) occurred between 1979 and 1998 and has been followed by slight global cooling over the past 10 years. Ergo, <u>dangerous global warming is not occurring.</u> " (The Age, 27.06.2011)

inductively found while testing the code book	deductively found from the literature review
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5.2. The process of coding

This research analyses newspaper articles using a deductive-quantitative approach which first collects – based on Entman’s (1993) four frame elements – frame sub-dimensions derived from the literature and from testing the code book. After coding the articles on climate change in German and Australian quality newspaper using all the frame sub-dimensions, all frame sub-dimensions were aggregated using the statistical technique of a cluster analysis via SPSS as well as contingency tables and t-tests.

To identify the different frame sub-dimensions in the second stage coding, the focal words “Klimawandel”/”climate change” and “Erderwärmung”/”global warming” were first highlighted in the text. Second, the whole phrase in which the focal words appear was analysed to identify the frame sub-dimensions. The context of this central phrase was scrutinized to check if it supports the findings (see Figure 7).

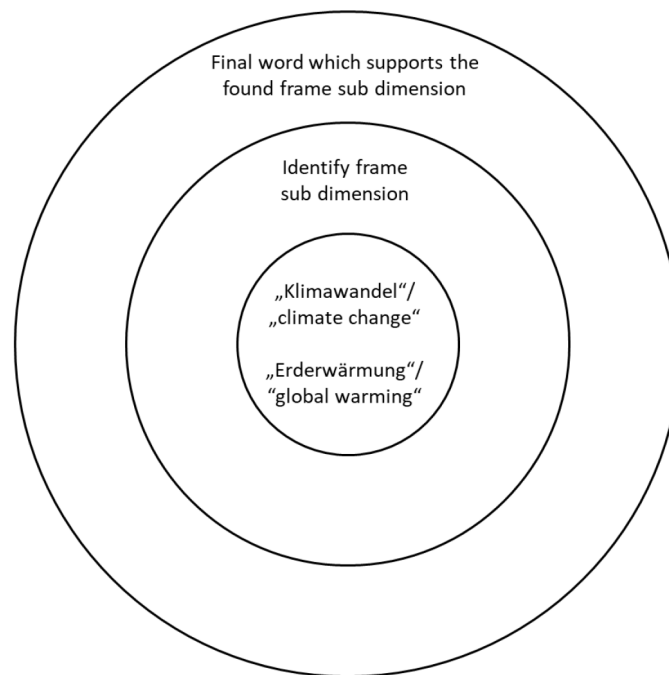


Figure 7: Analysis model

Source: own figure

To explain the coding process, first, an article from *Süddeutsche Zeitung* is taken and the example in Figure 8 shows that the keyword “climate change [Klimawandel]” is connected

with “gives beekeepers a raw deal [spielt den Imkern übel mit]” which represents the frame element “Problem definition” and implies that “climate change exists and is a problem”.

The “loss of one third of the bee colonies [Verlust von einem Drittel der Bienenvölker]” refers to the frame element “Causal Interpretation (Effects of Climate Change)” and stands for the frame sub-dimension “Effects on Nature: Changes in biodiversity – negative consequences” because it explains the negative consequences of climate change, in this case a warm winter for the bees.

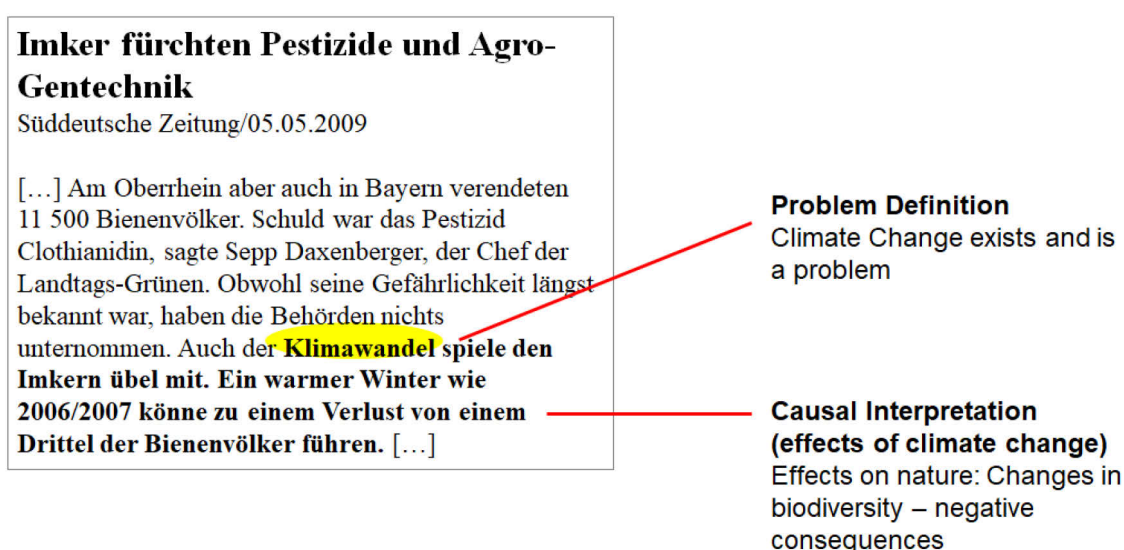


Figure 8: Coding example/Süddeutsche Zeitung

Source: own figure

An example from *Frankfurter Allgemeine Zeitung* (see Figure 9) discusses the consequences of carbon emissions on climate change. The “problem definition” is “climate change exists and is a problem” due to the fact that the keyword “climate change” is connected with the statement that “thirty million tonnes (gigatons) of carbon are emitted into the atmosphere every year and contribute to climate change [gelangen jährlich fast dreißig Milliarden Tonnen (Gigatonnen) des Treibhausgases in die Atmosphäre und tragen so zum Klimawandel bei]. The “problem definition” is further supported by the term “climate killer [Klimakiller]”. Moreover, the text implies that “human activities [menschliche Aktivitäten]” are the cause of these emissions and, thus, of climate change. This represents the sub-dimension “Human activities, in general” in the frame element “Causal interpretation (causes of climate change)”. The statement that “carbon emissions must be reduced drastically [Emis-

sionen müssen drastisch vermindert werden]” represents the sub-dimension “General reduction of greenhouse gases – international focus” of the frame element “Treatment recommendation”.

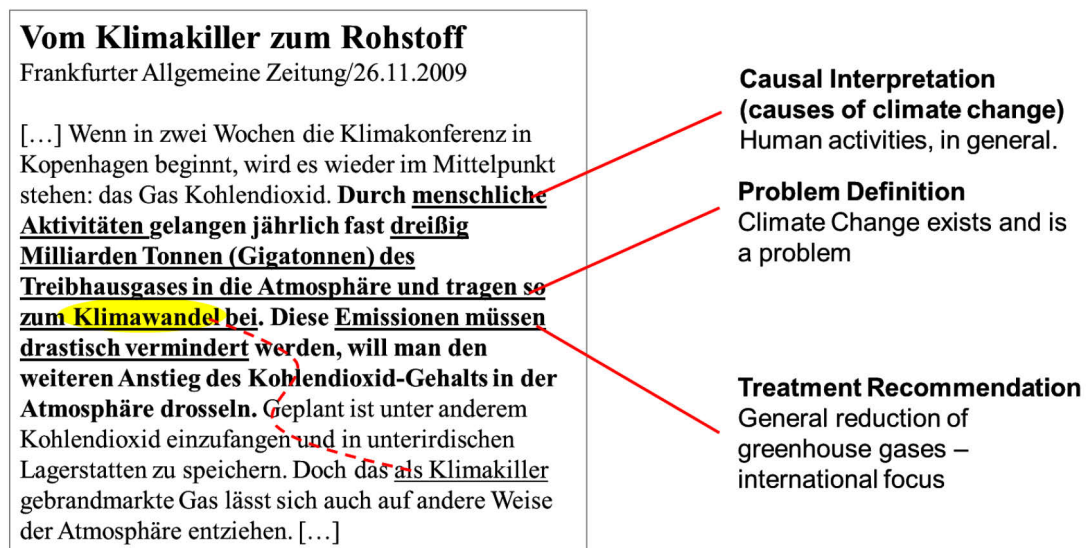


Figure 9: Coding example/Frankfurter Allgemeine Zeitung

Source: own figure

The following extract from “The Age” is an example of the minimum requirement regarding coding: in this article, only a “problem definition” can be found. By referring to “its associated consequences” and connecting it to “the issue of our lifetime”, it implies that “climate change exists and is a problem” (see Figure 10).

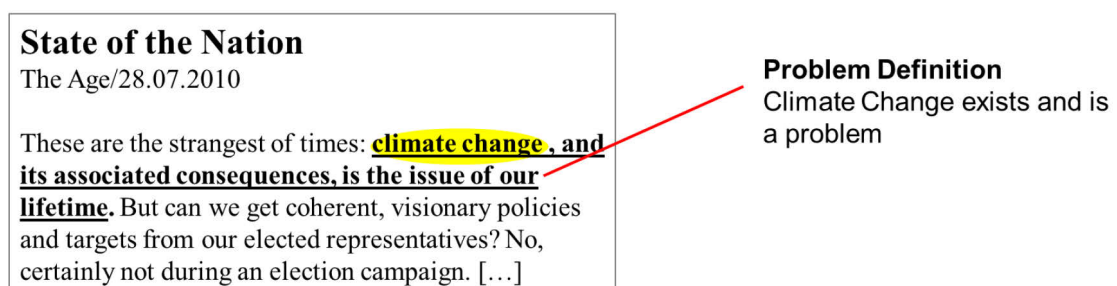


Figure 10: Coding example/The Age

Source: own figure

The last example – from *The Sydney Morning Herald* (see Figure 11) – states that “the most serious aspect of climate change is the equity dimensions of the problem” and, consequently, defines the “problem definition” as “climate change exists and is a problem”. In this context, it connects climate change with the “increase in concentration of greenhouse gases”. The article also clearly identifies the “responsibility” saying that it “lies with the developed countries”. The second paragraph shown in Figure 10 concerns the economic aspects. It says – using the example of India – that its “own path of development” is necessary, looking at “reasons of energy security, reduced local pollution and in several respects the creation of new employment”. This refers to the “treatment recommendation” that “economic aspects must be changed because of climate change”.

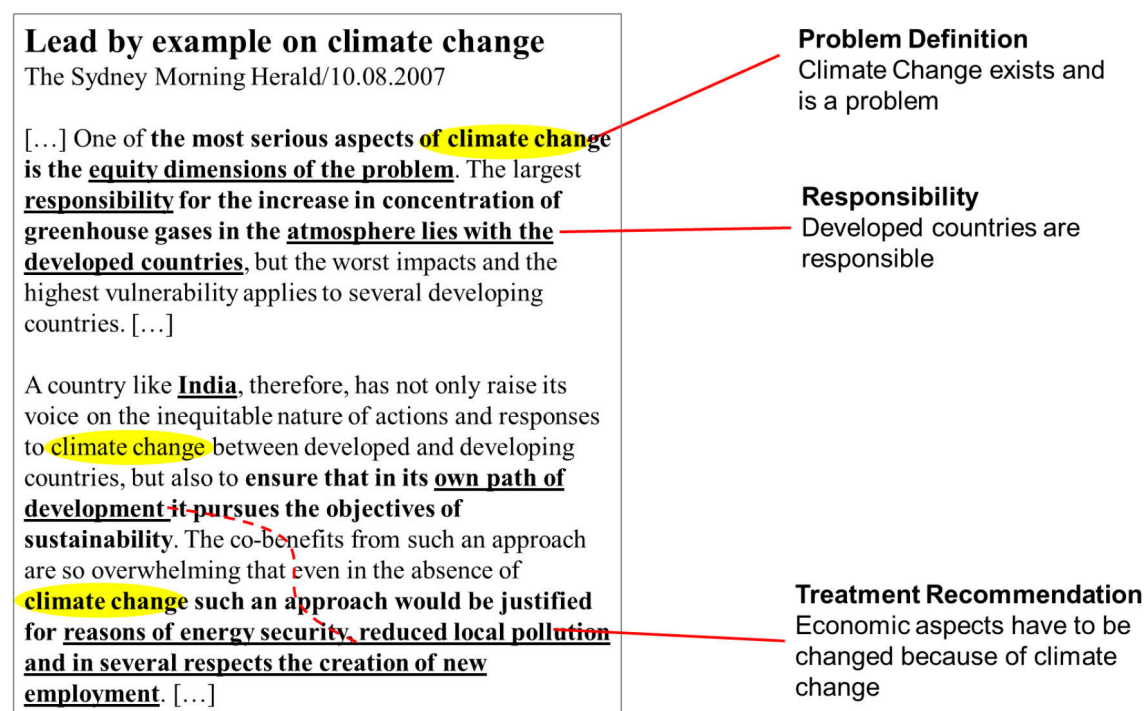


Figure 11: Coding example/*The Sydney Morning Herald*

Source: own figure

To test the reliability of the coding process, a second sample was taken from the sample of 1,012 articles. This sample included five articles from each of the four newspapers and for both events, including the search term “Klimawandel/climate change” as well as five articles including the search term “Klimaerwärmung/global warming”. So, a sample of 80 articles was coded a second time.

Altogether 170 frame sub-dimensions were identified, 47 per cent of which refer to the frame element “Problem definition” ($n = 80$), 9 per cent to the frame element “Causal Interpretation (causes of climate change)” ($n = 15$), 21 per cent to “Causal interpretation (effects of climate change)” ($n = 35$), 3 per cent to “Responsibility” ($n = 5$) and 21 per cent to the frame element “Treatment recommendation” ($n = 35$).

The frame element “Problem definition”, which, at the very least, must be part of each article, achieves a coefficient of 0.98. The frame element “Causal interpretation (causes of climate change)” gets a coefficient of 0.87. The frame element “Causal interpretation (effects of climate change)” has a coefficient of 0.80. And the frame element “Treatment recommendation” achieves a coefficient of 0.74. Only the frame element “Responsibility” has a rather poor coefficient of 0.40. However, this frame element was not included in the analysis because only 19 of 1,012 articles include a responsibility frame sub-dimension. So, the poor reliability of the “Responsibility” frame element does not influence the analysis and the results of this research (see Appendix B).

The weighted average coefficient was 0.87 (see Appendix C). As a perfect coefficient has a value of 1, the weighted average coefficient of all five frame elements suggests good reliability (Raup and Vogelsang 2009, p. xiv).

The coefficient for the actors was 0.87, the coefficient of the form of expression (commenting/informing) was 0.89 (see Appendix B).

5.3. Summary: methodology

The quantitative analysis in this study investigates two German as well as two Australian national quality newspapers during the two events of relevance.

The keywords used to identify the articles for the basic frame analyses were “Klimawandel”/“climate change” and “Erderwärmung”/“global warming”. Altogether, 9,850 articles were found in the German and Australian media that were examined in the defined time period, and 1,012 articles – 375 articles from Germany and 637 articles from Australia – were analysed.

The reliability test identified a weighted average coefficient for the framing of 0.87, for the actors of 0.87 and for the form of expression of 0.89.

6. Analysis

The major task of this analysis was to find significant differences and similarities between the climate change coverage in quality newspapers in Germany and Australia in the context of an election and an environmental disaster. This is why this chapter tests the hypotheses – introduced in Chapter 4 – on the 1,012 articles from Germany and Australia. The hypotheses are extended by asking sub research questions which are derived from the theoretical findings (see Chapters 2 and 3).

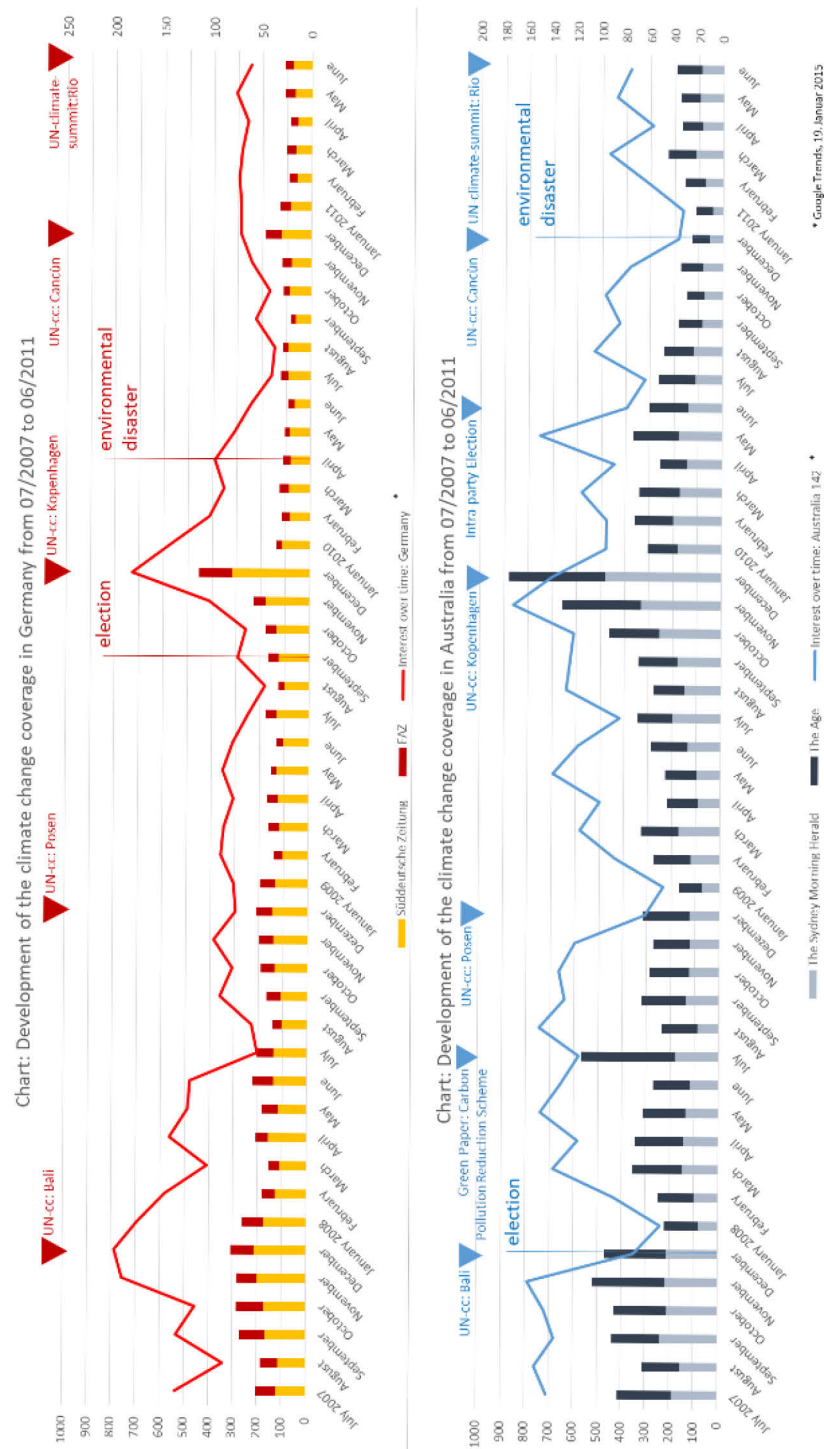
As explained in Chapter 5: Study Design, the inquiry started in 07/2007, six months before the Australian election, and ended in 06/2011, six months after the Australian environmental disaster, the Queensland floods. During this time period, there was a German election, in 09/2009, and a German environmental disaster, the Oder floods, in 05/2010.

To get an overview of climate change coverage in the two countries, Table 20 provides an overview of all articles on “Klimawandel”/“climate change” and “Klimaerwärmung”/“global warming” which were published in these years of research in the four chosen newspapers.

Table 20 shows that, in Germany, climate change coverage has remained at a relatively stable low level in comparison with the Australian sample. There were some moderate swings during the UN Climate Conferences in Bali, Posen and Cancún and one extreme swing in 12/2009 during the UN Climate Conference in Copenhagen. The election in 9/2009 had only minor impact on the amount of Germany’s climate change coverage. It is also conspicuous that, after the Climate Conference in Copenhagen, the amount of climate change coverage significantly declined and remained at a lower level than before, with just a moderate upward swing during the months in which the climate conferences took place.

In Australia, the picture is different: the swings there were much more prominent. During the six months before the election in 07/2007, the amount of climate change coverage was at a high level. Another increase in climate change coverage took place in July 2008 when the “Green Paper: Carbon Pollution Reduction Scheme”, an initiative of the Australian government, was introduced as well as in 12/2009 during the UN Climate Conference in Copenhagen. The climate conferences in Posen as well as in Cancún had only a minor influence on the amount of climate coverage. As in Germany, the amount of climate change coverage significantly decreased after the Copenhagen conference and, since then, remained at a lower level, too. The environmental disaster in 12/2009 also had no influence on the amount of climate change coverage, in Australia.

Table 20: Climate Change Coverage in Germany and Australia



Source: own figure

To evaluate the findings, Table 20 also includes a “Google Trend Analysis” in the form of line graphs. The line graph shows the number of people using the search terms “Klimawandel”/“climate change” and “Klimaerwärmung”/“global warming” in the research period. The line graphs and the bar graphs, representing the amount of climate change coverage, are superimposed on each other to get information about the publics’ searching behaviour regarding the two search terms. This chart makes clear that, in both countries, the search behaviour of the public mostly coincided with the amount of climate coverage, a fact that shows the power of the traditional media. A main finding relates to the graphs around climate conferences: in Germany, public concern was high during the climate conferences, whereas in Australia, the public interest was high before each climate conference started. Generally, in Australia readers’ awareness seems to be more inconsistent than in Germany.

As the bar graphs for both countries show, the line graphs’ turning point is also the Copenhagen conference: the expectations were high, but they were not fulfilled. “Weltrettung vertagt! [Salvation of the world adjourned!]” was one headline of *Die Zeit* (2009) after the conference. After this conference, the interest of the public clearly declined, but remained more or less stable at this lower level. The environmental disasters, in addition, do not seem to have had any influence on climate change coverage.

So, despite few differences between the two countries, it is clear that coverage by the quality newspapers and the interest of the public in climate change are mostly correlated.

6.1. Preparing the analysis

The preparation of this analysis started by examining the frame sub-dimensions, based on Entman’s (1993) frame elements.

The first frame element “Problem definition” – the only dimension which had to be part of every climate change article – shows that coverage in Germany and Australia mainly corresponded to the frame sub-dimension “Climate change exists and is a problem”. As many as 925 articles out of 1,012 (i. e. 91.4 per cent of all articles) made this claim. The frequency of correspondence with the remaining frame sub-dimensions of “Problem definition” is therefore much smaller.

This finding related to “Problem definition” is not the only example of a skewed distribution. Testing the frequency of all sub-dimensions, the findings show that several frame sub-dimensions, such as “Everybody is responsible” just appears few times (see Table 21 to Table

25). Because most frame sub-dimensions, therefore, are not sufficiently present to test the hypothesis properly, four steps were necessary to prepare the data for the examination:

1. frame sub-dimensions are summarised to create new indices whenever necessary and meaningful
2. actors are consolidated into actor groups whenever necessary and meaningful
3. the way climate change coverage is represented, i. e. whether it is commenting or informing, is detected
4. a two-step cluster analysis is applied to identify frames of climate change.

First, the *frame sub-dimensions are summarised to create new indices*. All frame sub-dimensions referring to the frame element “*Problem definition*” are summarised in one index “*Problem definition*”, which includes three values: “Climate change exists and is a problem” as a value which conforms with the scientific consensus gets the data value “1”, “Climate change is a subject of controversial debate”, “Climate change is not fully examined” and “Climate change exists, but is not a problem” – the three values which are not clear about whether climate change is a problem are assigned to the data value “-1” and “Climate change does not exist” as the statement most opposite to the scientific consensus gets the data value “-2” (see Table 21).

For all new indices the following applies: if there are articles which include two of the sub-dimensions which are now consolidated, for example, “Climate change is a subject of controversial debate” as well as “Climate change does not exist” appear in one article, the new index is coded with the value “-2”.

Table 21: New indices of the frame element “problem definition”

Problem definition			
New index	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
“Problem definition”	“Climate change exists and is a problem”	925	1
	“Climate change is a subject of controversial debate”	59	-1
	“Climate change is not fully examined”	12	-1
	“Climate change exists, but is not a problem”	10	-1
	“Climate change does not exist”	11	-2
	No “Problem definition” mentioned	0	0

The number of problems is higher than 1,012, because 5 articles contain more than one “Problem definition”.

The second frame element – “Causal Interpretation (causes of climate change)” – does not appear in all of the 1,012 articles. Altogether, it is just represented 109 times. On most of these occasions, 49 times, it was stated that “Human activities in general” are the cause of climate change. In this frame element, too, frame sub-dimensions are consolidated into new indices: one group identifies human beings as causing climate change, that is to say the frame sub-dimensions “Human activities in general”, “Population increase”, “Destruction of forests” and “Emissions of greenhouse gases”. The other group denies that humans are a cause for climate change. It includes the frame sub-dimensions “Denying that humans are a possible cause” and “Natural causes”.

As in “Problem definition”, the frame element “causal interpretation (causes of climate change)” is also recoded: Articles with non-human causes – so “Denying that humans are a possible cause” and “Natural causes” – are now assigned the data value “-1”. So, the indices that are contrary to the scientific consensus again get a negative data value. The articles referring to human causes receive the data value “1” (see Table 22). The value “0” appears when there is a non-human as well as a human cause in one article.

Table 22: New indices of the frame element “causal interpretation (causes of climate change)”

Causal interpretation (causes of climate change)			
New index	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
“Causes of Climate change”	“Human activities in general”	49	1
	“Population increase”	3	1
	“Destruction of forests”	5	1
	“Emissions of greenhouse gases”	31	1
	“Denying that humans are a possible cause”	14	-1
	“Natural causes”	7	-1
	No “Causal interpretation (causes of climate change)” mentioned	918	0

The number of articles is higher than 1,012, because 6 articles contain more than one “Causes of climate change”.

The frame element “Causal Interpretation (effects of climate change)” consists of 16 frame sub-dimensions referring to effects on nature, for example “Effects on nature: results of warming”, effects on weather, for example “Effects on the weather: more extreme weather”, effects on humans, for example “Effects on humans: food/water supply”, and effects on the

economy, such as “Effects on the economy: economic problems including costs”. Also these frame sub-dimensions are consolidated into four new indices which concentrates on the main consequences of climate change: 1. “Effects on nature” (174 times), 2. “Effects on the weather” (110 times), 3. “Effects on humans” (57 times), and 4. “Effects on the economy” (151 times).

All frame sub-dimensions included get the data value “1”, but “Effects on nature: Changes in biodiversity – positive consequences” and “Effects on the economy: economic benefits”. They get the data value “-1” (see Table 23) due to emphasising positive aspects of climate change. The value “0” appears when there is a positive effect as well as a negative effect of climate change in one article.

Table 23: New indices of the frame element “causal interpretation (effects of climate change)”

Causal interpretation (effects of climate change)			
New indices	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
“Effects on nature”	“Effects on nature: reduction of resources (fossil fuels, tree population etc.)”	1	1
	“Effects on nature: Changes in biodiversity - negative consequences”	39	1
	“Effects on nature: sea-level rise”	36	1
	“Effects on nature: forest fires”	14	1
	“Effects on nature: erosion”	2	1
	“Effects on nature: results of warming”	73	1
	“Effects on nature: changes in biodiversity – positive consequences”	9	-1
	No “Effects on nature” mentioned	863	0
“Effects on the weather”	“Effects on the weather: temperature increase”	53	1
	“Effects on the weather: more extreme weather”	57	1
	No “Effects on weather” mentioned	917	0
“Effects on humans”	“Effects on humans: epidemics, diseases, death etc”	15	1
	“Effects on humans: climate change refugees/suffering of the poor”	15	1
	“Effects on humans: food/water supply”	29	1
	“Effects on humans: future generations are climate change victims”	13	1
	No “Effects on humans” mentioned	982	0

Causal interpretation (effects of climate change)			
New indices	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
"Effects on the economy"	"Effects on the economy: huge negative effects if we do nothing, less negative effects if we combat climate change"	4	1
	"Effects on the economy: economic problems including costs"	119	1
	"Effects on the economy: economic benefits"	28	-1
	No "Effects on economy" mentioned	868	0

The number of articles is higher than 1,012, because 19 articles contain more than one "Effects on nature", 15 more than one "Effects on weather", 6 more than one "Effects on humans", and 7 more than one "Effects on economy".

The frame element "Responsibility" includes the most surprising result: only 1.9 per cent of all articles include a responsibility frame element. So, the media in both countries does not support the development of a sense of responsibility among their readers. The sub-dimensions "Everybody is responsibly" and "Developed countries are responsible" both appear eight times in all articles, i. e. in 0.8 per cent of all articles. All other sub-dimensions occur less than eight times. Because of this, only the pro-climate change sub-dimensions – "Everybody is responsible", "Humans have moral deficits", and "Developed countries are responsible" – are consolidated to a new responsibility index. The data value is "1" (see Table 24).

Table 24: New indices of the frame element "responsibility"

Responsibility			
New index	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
"Responsibility"	"Everybody is responsible"	8	1
	"Humans have moral deficits"	3	1
	"Developed countries are responsible"	8	1
	No "Responsibility" mentioned	988	0

The number of articles is lower than 1,012, because 5 articles are not considered in the new index "Responsibility".

The frame element “Treatment recommendation” is the most extensive frame element, including 22 frame sub-dimensions. The frame sub-dimensions are consolidated into five indices: 1. A general group which consists of the two most conflicting sub-dimensions “Something must be done, in general” and “No treatment required: there is not a problem”, 2. An energy group (including “Smaller personal carbon footprint”, “Reduction in the use of fossil fuels”, “Use of renewable energies”, “Nuclear energy helps to reduce emissions/fossil fuel quarrying” and “Replacing/displacing one energy source with another”) 3. Treatment recommendations which refer to national activities (including “Rebuilding a natural environment”, “General reduction in greenhouse gases – national focus”, “Demand climate change policy – national focus”, “Reward climate-friendly behaviour”, “Demand more responsibility from the government/politicians”, “Something must be done, but this should not influence economic growth”, “Economic aspects must be changed because of climate change (including greenwashing)”, “No treatment required: the economy comes first”) 4. Treatment recommendation regarding international activities (including “General reduction of greenhouse gases – international focus” and “Demand climate change policy – international focus”), and 5. Treatment recommendations involving increased information (including “Increased knowledge about climate change”, “Scientific development”, “Ask (the media) to stop publishing climate-change-sceptical positions”, “Take measures to mitigate the effects of climate change”, “Tips for preventing the effects of climate change”).

“Treatment recommendation” includes three frame sub-dimensions with a negative data value: In the “Treatment recommendation: general”-index “No treatment required: there is no problem” as most opposed to the scientific consensus gets a data value of “-2”. The index “Treatment recommendation: national activities” includes the frame sub-dimension “Something must be done, but should not influence economic growth”, which gets a data value of “-1”, and “No treatment required: the economy comes first”, which – as “No treatment required: there is no problem”, i. e. says do nothing – also gets the data value “-2”. The value “0” appears when there are sub-dimensions of treatment recommendations in one article that have a data value of “-2” as well as two times a “1” – so with data values that cancel each other.

The index which appears most often is “Treatment recommendations: national activities” (171 times), followed by “Treatment recommendation: increased information” (98 times), “Treatment recommendations: international activities” (86 times), “Treatment recommendation: general” appears 84 times), and “Treatment recommendation: energy” 60 times (see Table 25).

Table 25: New indices of the frame element “treatment recommendation”

Treatment recommendation			
New indices	Includes the following frame sub-dimensions	Number of cases (n =)	Data value
“Treatment recommendation: general”	“Something has to be, in general”	81	1
	“No treatment required: there is no problem”	3	-2
	No “Treatment recommendation: general” mentioned	928	0
“Treatment recommendation: energy”	“Smaller personal carbon footprint”	11	1
	“Reduction of using fossil fuels”	6	1
	“Use of renewable energies”	26	1
	“Nuclear energy helps to reduce emissions/fossil fuel quarrying”	10	1
	“Replacing/displacing one energy source with another”	7	1
	No “Treatment recommendation: energy” mentioned	957	0
“Treatment recommendation: national activities”	“Rebuilding a natural environment”	6	1
	“General reduction of greenhouse gases – national focus”	52	1
	“Demand climate change policy – national focus”	46	1
	“Demand more responsibility of the government/politicians”	26	1
	“Rewarding climate-friendly behaviour”	3	1
	“Economic aspects must be changed because of climate change (including greenwashing)”	35	1
	“Something must be done, but should not influence economic growth”	6	-1
	“No treatment required: the economy comes first”	4	-2
	No “Treatment recommendation: national activities” mentioned	882	0
“Treatment recommendation: international activities”	“General reduction of greenhouse gases – international focus”	46	1
	“Demand climate change policy – international focus”	40	1
	No “Treatment recommendation: international activities” mentioned	930	0
“Treatment recommendation: increased information”	“Increased knowledge about climate change”	18	1
	“Scientific development”	30	1
	“Ask (the media) to stop publishing climate-change-sceptical positions”	5	1
	“Take measures to mitigate the effects of climate change”	38	1
	“Tips for preventing the effects of climate change”	7	1
	No “Treatment recommendation: increased information” mentioned	891	0

The number of articles is higher than 1,012, because 21 articles contain more than one “Treatment recommendation: energy”, 10 articles more than one “Treatment recommendation: national activities”, 5 articles more than one “Treatment recommendation: international”, and 3 articles more than one “Treatment recommendation: increased information”.

Second, *the actors* who appear in Germany's and Australia's climate change coverage are consolidated. This results in six index groups of actors: scientists, politicians, journalists, members of civil society (for example, the public, the church, writers, artists), international actors (for example, politicians in the US, Russia, Europe), and economic actors (for example, the oil industry, insurance companies, and investors). If one of these six index group of actors appear, it is coded with the data value "1". If it does not appear, the data value is "0". If two or even more actors have a say in an climate change article, each of these actors is coded with the data value "1". The three most active actors are journalists (380 times), politicians (228 times), and scientists (222 times) (see Table 26).

Table 26: New indices of actors appearing in climate change coverage

Actors			
New indices	Includes the following frame sub-dimensions	Number of cases (n=)	Data value
Scientists	Scientists Germany, Scientist Australia, Scientists USA, Scientists Brussels/EU, Scientists UK/Ireland, Scientists India, Scientists Canada, Scientists Serbia, Scientists international groups, Scientific institutions, Scientist Ross Garnault/Climate change adviser, Scientists climate-sceptic, Scientific institutions which advise the Australian govt. (CSIRO, The Climate Group), British economist Nicolas Stern, Institutions which advise the German government in the context of climate change (WBGU, Klimasekretariat), Studies/Reports from scientists	222	1
	No "Scientists" mentioned	794	0
Politicians	Prime Minister of Australia (Gillard, Howard, Rudd), Chancellor/President of Germany (Merkel, Köhler), German Federal Ministers (Development, Agriculture, Environment, International Affairs, Science), Australian Federal Ministers (Climate Change, Environment), Australian Government including their committees, State Government/Parliament, Other politicians, National Party, Labor Party, Die Grünen/The Greens, Liberal Party, The Independents	228	1
	No "Politicians" mentioned	797	0
Journalists	Journalists	380	1
	No "Journalists" mentioned	632	0
Members of civil society	Writers, Artists, Australian of the Year, the Church, Environmental Organisations, Welfare Groups	105	1
	No "Members of the civil society" mentioned	911	0

Actors			
New indices	Includes the following frame sub-dimensions	Number of cases (n=)	Data value
International actors	United National, United Nations Climate Change Conference, International Panel of Climate Change (IPCC), Key Players USA, Key Players South America, Key Players UK, Key Players Italia, Key Players Danmark, Key Players Spain, Key Players Sweden, Key Players France, Key Players Island, Key Players Russia, Key Players India, Key Players Iran, Key Players Tibet, Key Players Japan, Key Players China, Key Players Mongolia, Key Players Indonesia, Key Players Africa, Key Players New Zealand	139	1
	No "International actors" mentioned	916	0
Economic actors	Economic Investors, Economic Industries, Oil Industry, Managers, Insurance Companies, Consulting Firms, Funding Firms, Media Owners	111	1
	No "Economic actors" mentioned	958	0

The number of actors is higher than 1012, because 11 articles contain more than one "Scientists", 19 articles contain more than one "Politicians", 9 articles more than one "Members of the civil society", 9 articles more than one "International actors", and 3 articles more than one "Economic actors".

Third, the frequencies of "*commenting*" or "*informing*" articles were identified. Table 27 shows that 171 out of 375 German articles (45.6 per cent) and 233 out of 637 Australian articles (36.6 per cent) were "commenting". A total of 204 out of 357 articles (54.4 per cent) of the German climate change coverage and 404 out of 637 articles (63.4 per cent) of the Australian climate change coverage were "informing" during the period covered by the research.

So, in both countries informing articles represented the dominant writing style.

Table 27: Articles are commenting/informing

	Germany (n = 357)	Australia (n = 637)
Commenting	171 (45.6 %)	233 (36.6 %)
Informing	204 (54.4 %)	404 (63.4 %)

Fourth, to *identify frames of climate change*, a two-step cluster analysis was used. The following indices were used: "Problem definition", "Causes of climate change", "Effects on nature", "Effects on weather", "Effects on humans", "Effects on the economy", "Treatment recommendation: energy", "Treatment recommendation: national activities", "Treatment

recommendation: international activities” and “Treatment recommendation: increased information”. The index “Treatment recommendation: general” is not considered in the cluster analysis because it does not include concrete statements about climate change, but only general messages. In addition, the index “Responsibility” is not considered for the cluster analysis due to its low incidence.

Because cluster analyses often react to different orders of the data used, it was first explored whether a change of data would influence the results of the clusters. However, all orders produced the same result: a seven-cluster solution was found with “good” quality.

The first cluster is called “Disconnected problem definition”. This index refers mainly to “Problem definition” and, thus, just includes the general message that there is an issue called “climate change” (1.00) (see Table 28). This cluster also involves a few voices that see positive “Effects on the economy” (-.03) while referring marginally to “Effects on nature” (.19). This cluster “Disconnected problem definition” appears 416 times (41.1 per cent).

The second cluster is “Focus on consequences excluding effects on the economy”. It appears 182 times (17.9 per cent) and includes consequences of climate change, except those referring to the economy. Looking at this second cluster in more detail, it considers all indices that look at the ecological effects of climate change, i. e. “Causes of climate change” (mean: .29), as well as “Effects on nature” (mean: .22), “Effects on weather” (mean: .42) and “Effects on humans” (mean: .32). “Effects on the economy” is not a topic in this second cluster. This aspect is the central one in the third cluster.

The third cluster is “Economic consequences” and it appears 81 times (8.0 per cent). It concentrates clearly on “Effects on the economy” (mean: 1.00) and also includes “Problem definition” (mean: 1.00). So, this cluster expresses the influence of climate change on economic aspects.

The fourth cluster is “Treatment recommendation national” and it refers to all treatment recommendations with a national focus (mean: 1.18). “Problem definition” (data value ranges from “-2” to “1”) also has a high data value in this cluster (mean: .98) and it shows that it is accepted that climate change is a problem. This fourth cluster appears 93 times (9.2 per cent).

Table 28: Distribution of indices in the seven clusters

Name of Cluster	(n =)	Problem Definition	Causes of climate change	Effects on nature	Effects on weather	Effects on humans	Effects on economy	Treatment rec. energy	Treatment rec. national	Treatment rec. international	Treatment rec. information
"Disconnected Problem Definition"	416	Mean	1.0000	.0000	.1923	.0096	.0024	-.0313	.0000	-.0072	.0000
"Focus on Consequences without Economy"	182	Mean	.9615	.2912	.2198	.4231	.3242	.0385	.2637	.0934	.0220
"Economic Consequences"	81	Mean	1.0000	.0123	.0864	.1358	.0370	1.0000	.0000	.0864	.0000
"Treatment recommendation National"	93	Mean	0.9785	.0323	.0108	.0215	.0000	.0108	.0430	1.1828	.0323
"Treatment recommendation International"	79	Mean	.9241	.0380	.0506	.0633	.0253	.1013	.0506	.0759	.0886
"Focus on treatment Information"	76	Mean	.9737	.0658	.1711	.0921	.0526	.1053	.0395	.1053	1.0263
"Skeptics"	81	Mean	-1.1111	.0000	.0123	.0000	.0247	.0123	.0123	.0741	.0494

The fifth cluster is “Treatment recommendation international” and it appears 79 times (7.8 per cent). This cluster mainly includes treatment recommendations with an international focus (mean: 1.04), so statements from international politicians and scientists demanding climate change action. In addition, this cluster refers to “Effects on the economy” (mean: .10). Because “Effects on the economy” has the data values “1” and “0”, this result shows that some 10.0 per cent of articles included economic effects as a topic.

The sixth cluster is “Focus on treatment information”. This cluster considers all treatment recommendations which demand more information about climate change from scientists, the government etc. (mean: 1.03). These broadly refer to “Causes of climate change” (mean: .07), “Effects on nature” (mean: .17), “Effects on weather” (mean: .09), and “Effects on the economy” (mean: .10).

The seventh cluster is “Sceptics”. It mainly includes sceptical positions appearing in “Problem definition” (-1.1111). It appears 81 times (8.0 per cent).

Four cases were identified as outliers. They were excluded and not assigned to any cluster. Therefore, all analyses including the results of the cluster analysis, are based on 1008 cases.

The seven clusters correspond to Entman’s (1933) definition of framing and, thus, offer broad opportunities to illustrate German and Australian climate change coverage: on the one hand, it represents the priorities of economic and non-economic consequences, and, on the other hand, it illustrates the demand for action in terms of climate change on a national as well as international basis and the demand for more information about climate change, so the demand for better understanding climate change as an issue. In addition, the clusters “Disconnected problem definition” and “Sceptics” stand for two mindsets related to climate change, which just define the issue “climate change” as existing or not existing without being concrete.

Table 29 introduces the seven clusters by showing their name, their appearance as well as their characteristics. In addition, this table includes examples from the four newspapers, citing extracts of articles which show how each of the clusters are represented in climate change coverage.

Table 29: Seven clusters of climate change coverage

Name of Cluster	Appearance	Characteristics	Examples
"Disconnected problem definition"	416 times (41.1 %).	Articles including mainly the frame element "problem definition".	<ol style="list-style-type: none"> 1. "Australia's major cities are lagging behind those in Europe, South Africa and the United States in rolling out programs to tackle climate change, a new global report reveals." (The Age, 12.06.2012) 2. "Insbesondere die Folgen des Klimawandels und eingeschleppte Arten sind nach IUCN-Angaben nur schwer rückgängig zu machen." (FAZ, 19.06.2012)" 3. "Two geoscience professors from Pennsylvania State University, Kevin Furlong and Charles Ammon, use natural disaster movies to help teach students about climate change and environmental disasters." (SMH, 28.03.2011)
"Focus on consequences excluding effects on the economy"	182 times (17.9 %)	Consequences of climate change, except those referring to the economy.	<ol style="list-style-type: none"> 1. "The Intergovernmental Panel on Climate Change predicts a sea-level rise of up to 59 centimetres over the next century, a level that would inundate most of the Maldives' inhabited atolls." (SMH, 07.01.2012) 2. "Stern predicted global warming of between three and 10 degrees this century unless greenhouse gas emissions were reduced." (The Age, 12.12.2007) 3. "'Now there are warnings that with climate change triggering higher seas and fiercer, more frequent storms, we may soon need to buffer Sydney's beaches from erosion by 'nourishing' them with sand mined from the sea floor. If we don't, within 30 years we are going to see houses falling into the beach,' warns Dr Ian Turner, a University of NSW scientist." (SMH, 08.01.2008)
"Economic consequences"	81 times (8.0 %)	Consequences of climate change, focusing on the economy.	<ol style="list-style-type: none"> 1. "Auch bei Finanzierungszusagen für ärmere Länder, die den Kampf gegen den Klimawandel und seine Folgen aus eigener Kraft nicht bewältigen können, müsse die EU mit gutem Beispiel vorangehen." (SZ, 05.11.2009) 2. "Nach den Berechnungen der Umweltökonomin könnte der Klimawandel in den kommenden 50 Jahren durchschnittlich zu gesamtwirtschaftlichen Wachstumseinbußen von 0,5 Prozentpunkten pro Jahr führen." (SZ, 17.05.2010) 3. "But it took until 1987 for countries to agree to limit the production of CFCs by international treaty – a process opposed vigorously by the chemical industry." (SMH, 18.02.2011)

Name of Cluster	Appearance	Characteristics	Examples
"Treatment recommendation national"	93 times (9.2 %)	Refers to all treatment recommendations with a national focus – including voices of national politicians and scientists etc. as well as a demand for national action against climate change.	<ol style="list-style-type: none"> 1. "We know that the majority of people want action on climate change and want a sensible, rational approach to change." (SMH, 24.03.2011) 2. "Deacons Lawyers said councils would have to ensure risks from climate change in flood-constrained coastal areas had been addressed by developers and that they considered such risks in their decisions." (SMH, 08.01.2008) 3. "Sie [Angela Merkel] lehnt allzu verbindliche Verpflichtungen im Kampf gegen die Erderwärmung ab, die der Industrie schaden könnten." (SZ, 30.09.2009)
"Treatment recommendation international"	79 times (7.8 %)	Includes voices of international politicians and scientists etc. as well as international action against climate change.	<ol style="list-style-type: none"> 1. "So sollen im Kampf gegen den Klimawandel die Industriestaaten finanzielle und technologische Hilfe leisten." (FAZ, 30.11.2009) 2. "Die Länder, die das Kyoto-Protokoll ratifiziert haben, stehen für 30 Prozent aller globalen Emissionen. Das zeigt, dass wir den Klimawandel nicht alleine aufhalten können." (FAZ, 26.05.2010) 3. "The IPCC report will be released Saturday in Spain at the meeting attended by the UN Secretary-General, Ban Ki-moon, and is expected to carry a direct warning that without urgent action over the next five to 10 years, the world's leaders risk climate change accelerating at dangerous levels." (SZ, 15.11.2007)

Name of Cluster	Appearance	Characteristics	Examples
"Focus on treatment information"	76 times (7.6 %)	Considers all treatment recommendations which demand more information about climate change.	<ol style="list-style-type: none"> 1. "Tackling the challenges of climate change will require us all to understand not just the science of climate change but also what options we have to respond to it and mitigate further change. ... We must be clear about what is happening now, and that information must be available to everyone." (The Age, 13.07.2010) 2. "There is a lot more Brown and the Greens want if Labor wins: mandated zero greenhouse gas emission, the effective end of coal-fired power generation, phasing out of coal exports, a ban on new coalmines or power stations, removal of GM crops, and active discouragement of cars." (SMH, 24.07.2010) 3. "The existence of dissenting voices is a mark of democracy, but this does not mean that balance in reporting scientific and policy debates is achieved by giving opposing sides equal weight when that 'balance' does not remotely resemble the weight of scientific support for human-caused climate change." (The Age, 29.03.2011)
"Sceptical views"	81 times (8.0 %)	Includes all sceptical positions, for example articles that question the existence of climate change, that claim that it is man-made, and the scientific results of climate change	<ol style="list-style-type: none"> 1. "He believes climate change is a pagan superstition and that global temperatures were, in fact, higher in Roman times and the Middle Ages." (SMH, 19.03.2011) 2. "The clear impression is that Asian-driven coal demand is a more powerful juggernaut than climate change. As one English delegate put it: 'The Chinese don't give a stuff about greenhouse emissions, and nor do I.'" (The Age, 14.11.2010) 3. "The opening session set the tone. Fred Palmer, vice-president of Peabody Energy, the world's largest coal company, noted that since the 'great debate' on climate change began, coals consumption had gone from 3.6 billion tonnes a year to almost 7 billion tonnes." (The Age, 14.11.2010)

The results of this cluster analysis confirm that the theoretical discussion about climate change in Chapters 2 and 3 introduces the right hypotheses. By the analysis of the clusters the hypotheses can be tested and the research questions can be answered. For example it can be verified whether Australia's climate change coverage focuses on frames of causes and effects of climate change as well as on climate change action (hypothesis 1). Moreover, the expectations from the theoretical findings are that there is a common representation of the climate-change-sceptical viewpoint in Australian climate change coverage, whereas it is not

part of the German climate change coverage (for example, hypothesis 3). The cluster “Sceptics” gives an answer to this assumption. Additionally, the seven clusters can answer the question whether German newspapers might represent a broader variety of perspectives on climate change than Australian newspapers do (for example, hypothesis 4a).

The following analysis, in addition, is based on three questions which guide all the hypotheses. These are:

1. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the two countries and how can the observed differences be explained?
2. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the election and the environmental disaster and how can the observed differences be explained?
3. Which similarities/differences are found in the climate change coverage of Germany and Australia when comparing the time before and after the respective events and how can the observed differences be explained?

Within these three comparative sub research questions three aspects are examined:

1. Do the frames/frame sub-dimensions differ between the quality newspapers in the countries?
2. Which actors represent the climate change frames/frame sub-dimensions?
3. Which form of expression (commenting/informing) is more frequently used comparing the countries and the two events?

6.2. Testing the hypotheses and sub research questions

This chapter is structured according to the three questions which guide all the hypotheses and sub research questions. The first part tests the hypotheses and sub research questions which compare the climate change coverage in Germany with that in Australia. The second part focuses on a comparison of the election and the environmental disaster. And the third part includes all hypotheses and sub research questions comparing the time before and after the two events. All issues are tested in terms of frames/frame sub-dimensions, actors, and form of expression – as long as this is reasonable.

6.2.1. Comparisons between Germany and Australia

The first part of the hypotheses test compares the framing of German climate change coverage with the framing of Australian climate change coverage. This is why it uses the indices (see Table 21 to Table 26) and the results of the cluster analysis (see Table 29) presented in the first part of this chapter.

Hypothesis 1: Australia's climate change coverage is dominated by frames of causes and effects as well as of action. Germany's climate change coverage remains unspecific, just defining the problem.

For this first hypothesis, the result of the cluster analysis is used. For the German part of the hypothesis, the cluster “Disconnected problem definition” is relevant, because it represents unspecific climate change coverage and, thus, operationalises the German part of the hypothesis. The Australian part of the hypothesis is operationalised by, on the one hand, “Focus on consequences excluding effects on the economy” and “Economic consequences”, representing frames of causes and effects. On the other hand, the clusters “Treatment recommendation – national”, “Treatment recommendation – international” and “Focus on treatment information” stand for frames of action.

To test hypothesis 1, the five clusters which represent the Australian climate change coverage are summarised in a new cluster “Climate effects and action”. “Disconnected problem definition” remains, as it represents the German climate change coverage. The cluster “Sceptics” is excluded from this test.

The contingency table (Table 30) shows that the percentage of “Disconnected problem definition” in Germany was higher (50.6 per cent) than in Australia (41.5 per cent). In Australia, the percentage of the new cluster “Climate Effects and Action” was higher (58.5 per cent) than in Germany (49.4 per cent).

The difference between the two countries is significant ($p < .01$). Hypothesis 1 is correct.

Table 30: Dominant clusters in German and Australian climate change coverage

Cluster		German Media	Australian Media
	n=	342	585
"Disconnected problem definition"	Number of articles (n)	173	243
	Percentage within a country	50.6	41.5
"Climate effects and action"	Number of articles (n)	169	342
	Percentage within a country	49.4	58.5
Chi ² value	7.1	Significance	p < .01

Hypothesis 2: Politicians in Australia have a greater stake in the representation of the national climate change discussion than those in Germany. They are more often mentioned in the country's newspapers than German politicians in German newspapers.

Hypothesis 2 uses the index "Politicians" (see Table 26) to compare the appearance of political actors in the two countries. This is why political actors are given the data value "1", while other actors are given value "0". Table 31 confirms this hypothesis, showing that Australia's politicians are the senders of 28.9 per cent of all climate change news, whereas in Germany only 11.7 per cent of all actors involved in climate change coverage are politicians. This difference between the two countries is significant (p < .001).

Table 31: Appearance of politicians in German and Australian climate change coverage

		Germany	Australia
	n=	375	637
"Politicians"	Number of articles (n)	44	184
	Percentage	11.7	28.9
No "Politicians" mentioned	Number of articles (n)	331	453
	Percentage	88.3	71.1
Chi ² value	39.8	Significance	p < .001

Hypothesis 3: In Australia, the representation of climate-change-sceptic viewpoints is a normal aspect of climate change coverage. German newspapers rarely give space to such sceptical voices.

To test hypothesis 3, the six clusters which do not represent sceptical viewpoints on climate change are summarised in a new cluster “Non-sceptics”, representing the German climate change coverage in terms of hypothesis 3. “Sceptics” remains as it represents the Australian climate change coverage.

The contingency table (Table 32) shows that the percentage of articles presenting “Sceptical views” is similar in both countries. The small difference between the two countries is not significant ($p = .49$).

Hypothesis 3 is not substantiated.

Table 32: “Sceptical” viewpoints in German and Australian climate change coverage

Cluster		German Media	Australian Media
	n=	375	633
“Sceptics”	Number of articles (n)	33	48
	Percentage	8.8	7.6
“Non-sceptics”	Number of articles (n)	342	585
	Percentage	91.2	92.4
Chi ² value	0.5	Significance	$p = .49$

Hypothesis 4a: German newspapers represent a broad variety of perspectives on climate change. The diversity of frame sub-dimensions is high. In Australia, the variety of perspectives on climate change is low.

To test Hypothesis 4a, all indices introduced in Table 21 to Table 25 are used, but the index “Problem definition”. It is excluded because “Problem definition”, at least, has to appear in each article and is, thus, not a sign for variety.

Then, all indices with a negative data value are consolidated in a new index group representing non-human-induced climate change: “Denying that humans cause climate change” (data value: -1) and “Natural causes” (data value: -1) from the index “Causes of climate change” as well as “Effects on nature: changes in biodiversity – positive consequences” (data value: -1) from the index “Effects on nature”, “Effects on the economy: economic benefits” (data

value: -1) from the index “Effects on the economy”, “No treatment required: there is no problem” (data value: -2) from the index “Treatment recommendation: general”, “Something must be done, but should not influence economic growth” (data value: -1) and “No treatment required: the economy comes first” (data value: -2) from the index “Treatment recommendation: national focus” are summarised to this new index group. So, all frame sub dimensions which see climate change as natural or having positive consequences are now together in this new index group.

Second, all frame sub dimensions from the above-mentioned indices as well as from the indices “Effects on the weather”, “Effects on humans”, “Treatment recommendation: international focus”, “Treatment recommendation: energy”, and “Treatment recommendation: increased information” having a positive data value, so all frame sub dimensions which identify climate change as a challenge, are summarise in another group.

Variety is found when one article includes more than one of these indices. So, when looking at hypothesis 4a, German newspapers are expected to represent more of these indices – so a broader variety – in their articles, whereas the expectation for the Australian climate change articles is that they mostly include only one index – so a low variety of perspectives.

An examination of the frequencies in both countries shows that 45.9 per cent of all articles have a low variety because they just include one of the indices. 14.0 per cent contain two indices, 4.9 per cent three and 2.0 per cent four indices, which represents a high variety. The new index group representing non-human-induced climate change and, thus, representing climate change as natural or having positive consequences, appears in 0.4 per cent of all articles. A total of 37.7 per cent of the articles just include a “Problem definition” and are, therefore, not part of this hypothesis test.

Comparing the variety of perspectives in Germany and Australia with the support of a t-test, the mean in Germany has a value of 0.83, while the mean in Australia has a value of 1.10. Thus, the Australian climate change coverage has a broader variety than the climate change coverage in Germany. The difference between the two countries is significant ($p < .001$) (see Table 33).

Table 33: *Variety of climate change coverage in Germany and Australia*

	Germany	Australia	
n =	375	637	
	Mean (SD)	Mean (SD)	t-value / significance
Variety of climate change coverage	0.83 (0.84)	1.08 (1.00)	- 4.3 / p < .001

The scale ranges from 0 to 5.

Hypothesis 4b: The variety of actors in German newspapers is higher than the variety of actors in Australian newspapers.

This is why the indices of actors – who are “scientists”, “politicians”, “journalists”, “members of civil society”, “international actors”, and “economic actors” (see Table 26) – are used. A variety of actors is found when more than one of these indices, for example a scientist and a politician, are quoted in the same article.

An examination of the frequencies in both countries shows that 87.2 per cent of all articles only include one actor, so do not have a variety of actors. A variety of actors was found in 10.8 per cent of the articles with two actors, 1.1 per cent with three actors, and 0.1 per cent with four actors.

As Table 34 shows, a t-test identifies the fact that the variety of actors was higher in Australian than in German media. This difference is also significant ($p < .001$). So, the Australian newspapers examined in this research do not only have a broader variety of perspectives on climate change, but also a broader variety of actors included in their climate change articles.

Table 34: *Variety of actors involved in climate change coverage*

	Germany	Australia	
n =	375	637	
	Mean (SD)	Mean (SD)	t-value / significance
Variety of actors in climate change coverage	1.05 (0.28)	1.16 (0.44)	-4.9 / p < .001

Each article could include a maximum of 4 actors. The scale ranges from 0 to 4.

Hypothesis 5: German journalists use an informing writing style for climate change coverage, while Australian journalists use a commenting one.

This hypothesis refers only to the actor group “Journalists”. Using the index “Journalists”, 380 articles are identified as having a journalist as an actor in German and Australian climate change coverage. A total of 167 of these articles (44.5 per cent) are found in German (n = 357) and 213 articles (33.4 per cent) in Australian newspapers (n = 637).

Looking at the form of expression of these articles – i. e. whether they are commenting or informing – a contingency table reveals that 52.1 per cent of all German articles with a journalist as an actor were informing and 47.9 per cent were commenting. In Australia, 55.4 per cent were informing and 44.6 per cent were commenting (see Table 35). The difference between the two countries is not significant ($p = .52$).

Table 35: Journalist use a commenting/informing writing style

		Germany	Australia
	n=	167	213
Informing	Number of articles (n)	87	118
	Percentage	52.1	55.4
Commenting	Number of articles (n)	80	95
	Percentage	47.9	44.6
Chi² value	0.4	Significance	$p = .52$

Hypothesis 6: German as well as Australian climate change coverage asks national politicians to tackle climate change.

This hypothesis was deduced from the public’s attitude to climate change: The literature about the public’s attitude to climate change states that in Germany as well as in Australia people “say others are responsible” and name “politicians” as accountable for tackling climate change. The public in both nations expects national politicians to act against climate change.

The frame element “Treatment recommendation” is used to test this hypothesis, because it contains frame sub-dimensions which involve asking national as well as international politicians to act.

The frame sub-dimensions which ask national political actors to take action are “Rebuilding a natural environment”, “General reduction of greenhouse gases – national focus”, “Demand

climate change policy – national focus”, “Demand more responsibility by the government/politicians”, “Reward climate-friendly behaviour”, “Economic aspects must be changed because of climate change (including greenwashing)”, “Something must be done, but should not influence economic growth”, and “No treatment required: the economy comes first”. These frame sub-dimensions are given the positive data value “1”. The frame sub-dimensions which ask international political actors to tackle climate change include “Reduction of greenhouse gases – international” and “Demand climate change policy – international”. They get a negative data value “-1”.

To arrive at a useful variable, the international frame sub-dimensions are derived from the national ones: (“Rebuilding a natural environment” + “General reduction of greenhouse gases – national focus” + “Demand climate change policy – national focus” + “Demand more responsibility by the government/politicians” + “Reward climate-friendly behaviour” + “Economic aspects need to be changed because of climate change (including greenwashing)” + “Something must be done, but should not influence economic growth” + and “No treatment required: the economy comes first”) – (“Reduction of greenhouse gases – international” + “Demand climate change policy – international”). This new variable “Treatment recommendation – national versus international” is used for a t-test.

Table 36 illustrates that the German media has an international reference (Mean: -0.04), whereas the media in Australia concentrates on national action in terms of climate change (Mean: 0.17). The difference between Germany and Australia in terms of “Treatment recommendation – national versus international” is significant ($p < .001$).

Table 36: “Treatment recommendation – national versus international” in Germany and Australia

	Germany	Australia	
n =	357	637	
	Mean (SD)	Mean (SD)	t-value / significance
“Treatment recommendation – national versus international”	-0.04 (0.41)	0.17 (0.59)	-6.5 / $p < .001$

The scale ranges from -2 (Treatment recommendation: international frame sub dimensions) to 3 (Treatment recommendation: national frame sub dimensions) .

This finding, nevertheless, shows that the public's attitude to climate change – the German as well as the Australian people expect national politicians to take action against climate change – is not fully represented in the media. What was published in the newspapers in Germany was actually the opposite.

Hypothesis 7: German climate change coverage contains very few frame sub-dimensions related to the effects of climate change. In Australia, the media widely covers the effects of climate change.

Hypothesis 7 is deduced from the literature about the public's attitudes and it is concerned with the impact climate change has on the people's life.

To test this hypothesis, the frame element "Causal Interpretation (effects of climate change)" is used. Bear in mind that this frame element was operationalized by four indices: 1. Effects on nature, 2. Effects on the weather, 3. Effects on humans, and 4. Effects on the economy. Two indices have a negative data value: "Effects on nature: Changes in biodiversity – positive consequences" and "Effects on the economy: economic benefits"; both have a data value of "-1".

A t-test shows that only the difference regarding the index "Effects on the weather" is significant ($p < .01$).

Because this hypothesis does not examine the effects of climate change in detail, but rather ask generally whether the effects of climate change are mentioned, the four indices are, in addition, summarised in one index. Testing this new index "Effects of climate change, in general" with a t-test, we find a small but significant difference ($p < .05$) (see Table 37).

Table 37: “Causal interpretation (effects of climate change)” in Germany and Australia

	Germany	Australia	
n =	375	637	
	Mean (SD)	Mean (SD)	t-value / significance
“Effects on nature”	.13 (.42)	.17 (.46)	-1.2 / p = .24
“Effects on the weather”	.07 (.29)	.13 (.39)	-2.9 / p < .01
“Effects on humans”	.08 (.29)	.07 (.28)	0.5 / p = .59
“Effects on the economy”	.07 (.35)	.11 (.36)	-1.5 / p = .13
“Effects of climate change, in general”	.09 (.20)	.12 (.22)	-2.2 / p < .05

“Effects on nature”: scale ranges from -1 to 3; “Effects on the weather”: scale ranges from 0 to 2; “Effects on humans”: scale ranges from 0 to 2; “Effects on the economy”: scale ranges from -1 to 1; “Effects of climate change, in general”: scale ranges from -0.25 to 1.25

6.2.2. Comparisons between the two events

The second part of the hypotheses test compares the framing of the two events. So, it investigates dominant frames/frame elements in the media coverage around the election and the environmental disaster, and it examines the depiction of the two events.

Sub research question 1: Does coverage during the environmental disaster emphasise national activities, whereas coverage during the election emphasises international activities?

A t-test uses the new variable „Treatment recommendation – national versus international” from Hypothesis 6 to find out whether coverage during the environmental disaster supports national activities and coverage during the election advocates international activities. This is why, on one the one hand, the time *after the environmental disaster* – the flooding – has happened is analysed. Because it is a national event, the assumption is that the newspaper coverage might discuss this environmental disaster in a national context. On the other hand, the time *before the election* is examined, i. e. the time during the election period when climate change might be used for propaganda reasons.

Table 38 demonstrates that the assumption of sub research question 1 is right: the climate change coverage before the election demanded almost as much national as international action (Mean: 0.09), while the coverage after the environmental disaster focused on national action (Mean: 0.20). The finding is significant ($p < .05$).

Table 38: “Treatment recommendation – national versus international” in the context of the election and the environmental disaster

	Before Election	After Environmental disaster	
n =	287	168	
	Mean (SD)	Mean (SD)	t-value / significance
“Treatment recommendation – national versus international”	0.09 (.50)	0.20 (.53)	2.4 / p < .05

Scale: -2 = “Treatment recommendation international” / 3 = “Treatment recommendation national”

To provide more detailed results on when “causal interpretation (effects of climate change)” (see Hypothesis 7) is part of the media discussion around the two events, the data set – again the time *after the environmental disaster* and the time *before the election* – is examined.

Sub research question 2: Does “causal interpretation (effects of climate change)” appear more often during the environmental disaster than during the political election?

The results of a t-test which concentrates on the two time periods – the time *after the environmental disaster* and the time *before the political election* – show that the four indices of “Causal interpretation (effects of climate change)” as well as the summarised index “Effects of climate change, in general” reveal no major differences (see Table 39).

Table 39: “Causal interpretation (effects of climate change)” before the political election and after the environmental disaster

	Before Election	After Environmental disaster	
n =	287	168	
	Mean (SD)	Mean (SD)	t-value / significance
“Effects on nature”	0.18 (.50)	0.14 (.42)	- 0.9 / p = .35
“Effects on the weather”	0.10 (.37)	0.16 (.40)	1.6 / p = .12
“Effects on humans”	0.06 (.26)	0.04 (.19)	- 1.1 / p = .27
“Effects on the economy”	0.10 (.38)	0.07 (.34)	- 0.9 / p = .39
“Effects on climate change, in general”	0.36 (.57)	0.38 (.63)	0.4 / p = .71

Effects on nature: scale ranges from -1 to 3; . Effects on the weather: scale ranges from 0 to 2; Effects on humans: scale ranges from 0 to 2; Effects on the economy: scale ranges from -1 to 1; Effects of climate change in general: scale ranges from -0.25 to 1.25

Hypothesis 8: Whereas the newspaper coverage before the election demands action, the media informs the public about the consequences of climate change after the time of the environmental disaster.

The assumption is that the newspaper coverage before the election is characterised by the clusters “Treatment recommendation – national, “Treatment recommendation – international” and “Focus on treatment information”, i. e. the three frames which stand for climate change action. The clusters “Focus on consequences excluding effects on the economy” and “Economic consequences” illustrate the consequences of climate change and, thus, are expected to be emphasised after the time of the environmental disaster.

Again the clusters are summarised to test hypothesis 8: “Treatment recommendation – national, “Treatment recommendation – international” and “Focus on treatment information” into the cluster “Climate action coverage”, “Focus on consequences excluding effects on the economy” and “Economic consequences” into the cluster “Climate consequences coverage”.

The contingency table shows that the percentage in “Climate action coverage” and “Climate consequences coverage” is very similar. “Climate action coverage” appears in 49.6 per cent of all articles during the time of the election and 45.6 per cent during the time of the environmental disaster. “Climate consequences coverage” is represented in 50.4 per cent of the climate change coverage around the election and in 54.4 per cent of all climate change coverage referring to the environmental disaster. The difference is not significant ($p = .55$). Hypothesis 8 is not substantiated (see Table 40).

Table 40: Comparison of “climate action coverage” and “climate consequences coverage” during the time of the election/environmental disaster

Cluster		Before Election	After Environmental disaster
	n=	137	90
“Climate action coverage”	Number of articles (n)	68	41
	Percentage	49.6	45.6
“Climate consequences coverage”	Number of articles (n)	69	49
	Percentage	50.4	54.4
Chi ² value	0.4	Significance	$p = .55$

Sub research question 3: Is the newspaper coverage of climate change around the election commenting and is it informing during the time of the environmental disaster?

This sub research question is based on two assumptions: 1. That politicians increase their public relations activities during the election period, which is reflected in commenting articles in the media, and 2. that an environmental disaster encourages journalists to provide facts and data to the public about climate change issues.

This is why the election period as well as the time after the environmental disaster are examined with a contingency table.

The contingency table demonstrates that none of the events has a major effect on the form of expression. A total of 61.9 per cent of all articles published during the election period were informing and 62.7 per cent after the environmental disaster. Only 37.3 per cent of the articles published before the election and 38.1 per cent of the articles examined during the time after the environmental disaster were commenting. There is no significant difference between these results ($p = .86$) (see Table 41).

Table 41: Commenting/informing writing style before the election/after the environmental disaster

Cluster		Before Election	After Environmental Disaster
	n=	287	168
Informing	Number of articles (n)	107	64
	Percentage	37.3	38.1
Commenting	Number of articles (n)	180	104
	Percentage	62.7	61.9
Chi² value	0.0	Significance	$p = .86$

In the discussion about the differences between the two events, the following sub research question about the actors arises.

Sub research question 4: Are political actors dominant during the time of the political election, whereas other actors are dominant during the time of the environmental disaster?

A conclusion concerning the dominance of either “political actors” or “other actors” arises from the two events themselves: “political actors” are assigned to the political election, while the “other actors” are assigned to the environmental disaster.

To test this sub research question, the indices “Politicians” and “International actors” – are summarised, on the one hand. On the other hand, all other actors, i. e. the indices “Members of civil society”, “Economic actors” and “Scientists”, are summed up. The index “Journalists” is excluded from the data set, because journalists are not cited in the coverage, but are the authors of the articles.

Then the “other actors” (indices “Members of civil society” + “economic actors” + “scientists”) are subtracted from the “political actors” (indices “politicians” + “international actors”), resulting in a new index “Dominance of political actors”. A positive mean of this new index “Political actors” vs. “others actors” would signify the dominance of political actors, while a negative mean would signify the dominance of “other actors”.

Using the new index and assigning it to the two events, a t-test shows that “political actors” appear a bit more during the political elections (Mean: -.02). However, during the environmental disaster, political actors are not considerably less evident (Mean: -.06). This result might appear because politicians have to do something in the context of an environmental disaster when they are expected to (at least) offer sympathy and organize rescue operations. The difference between the two events is not significant ($p = .54$) (see Table 42).

Table 42: “Political actors” vs. “others” in German/Australian climate change coverage

	Election	Environmental disaster	
n =	620	392	
	Mean (SD)	Mean (SD)	t-value / significance
Dominance of political actors	-.02 (0.92)	-.06 (1.00)	0.62 / $p = .54$

Scale: -3 = dominance of “Other actors” / +4 = dominance of “Political actors”

6.2.3. Comparisons before/after the event

The third part of this chapter compares the timeframes before and after the election and the environmental disaster. Each timeframe consists of data collected six months before and six months after the events.

Hypothesis 9: Australia's climate change coverage before the election was strongly dominated by frames of causes and effects as well as of action. After the election, the frames are more diverse.

Comparing the climate change coverage before and after the election in Australia, the clusters "Focus on consequences excluding effects on the economy" and "Economic consequences" again stand for the frames of causes and effects. The clusters "Treatment recommendation national", "Treatment recommendation international" and "Focus on treatment information" illustrate climate change action.

To test hypothesis 9, the cluster "Climate effects and action" from hypothesis 1 which summarises these five clusters is used. The other two frames "Disconnected problem definition" and "Sceptics" are summarised as well; this new cluster is called "General climate change coverage". The assumption in terms of hypothesis 9 is that the percentage of the cluster "Climate effects and action" will be higher before the political election, having a significant difference to the percentage appearing after election day.

Table 43 indicates that the percentages of the two periods in terms of "Climate Effects and Action" as well as "General Climate change coverage" were very similar: Before election day, the cluster "Climate Effects and Action" appeared 52.1 per cent and 55.3 per cent after election day. The cluster "General climate change coverage" had a percentage of 47.9 per cent before and 44.7 per cent after election day. Accordingly, the difference is not significant ($p = .94$). Hypothesis 9 is not substantiated.

Table 43: Australia: dominant clusters before and after the election compared – coverage during climate change conferences included

Cluster		Before the Election	After the Election
	n=	188	206
"Climate effects and action"	Number of articles (n)	98	114
	Percentage	52.1	55.3
"General climate change coverage"	Number of articles (n)	90	92
	Percentage	47.9	44.7
Chi² value	0.0	Significance	$p = .94$

Whether this hypothesis also relates to the German political election is the next sub research question.

Sub research question 5: Which of the defined frames from Hypothesis 9 were dominant before and after the German election?

For sub research question 5, the clusters “Climate effects and action” and “General climate change coverage” are used for examining the German climate change coverage.

The picture is, however, the same as in Australia: before election day, the cluster “Climate effects and action” appears 50.0 per cent and 44.7 per cent after election day. The cluster “General climate change coverage” has a percentage of 50.0 per cent before and 55.3 per cent after election day. The difference is also not significant ($p = .48$) (see Table 44).

Table 44: Germany: dominant clusters before and after the election and the environmental disaster compared

Cluster		Before the Election	After the Election
	n=	78	103
“Climate effects and action”	Number of articles (n)	39	46
	Percentage	50.0	44.7
“General climate change coverage”	Number of articles (n)	39	57
	Percentage	50.0	55.3
Chi ² value	0.5	Significance	$p = .48$

Hypothesis 10: Critical and sceptical voices accompanied the 2007 election before the Australian election day. After the election, the prominence of critical and sceptical voices was clearly reduced.

To test hypothesis 10, the two clusters from hypothesis 3 are taken – “Sceptics” and “Non-sceptics”.

In general, the frequency of sceptical voices is low during the 2007 election in Australia. Before the election the percentage is 6.5 per cent, after the political election, the percentage is 4.6 per cent. The difference is not significant ($p = .41$) (see Table 45).

Table 45: Australia: “Sceptics” before and after the election compared

Cluster		Before the Election	After the Election
	n=	201	216
“Sceptical views”	Number of articles (n)	13	10
	Percentage	6.5	4.6
“Non-Sceptical views”	Number of articles (n)	188	206
	Percentage	93.5	95.4
Chi ² value	0.67	Significance	p = .41

Hypothesis 11a: After the Queensland floods, the Australian newspaper coverage of climate change concentrates on the frame element “Causal interpretation (effects of climate change)”, in general.

Hypothesis 11b: After the Oder floods, the German newspaper coverage of climate change concentrates on negative effects regarding the frame element “Causal interpretation (effects of climate change)”.

As illustrated in Table 23, the frame element “Causal interpretation (effects of climate change)” consists of four indices: 1. “Effects on nature”, 2. “Effects on the weather”, 3. “Effects on humans” and 4. “Effects on the economy”. Bear in mind that “Effects on nature” and “Effects on the economy” include a frame sub-dimension with a negative data value each (“Effects on nature: Changes in biodiversity – positive consequences” and “Effects on the economy: economic benefits”).

To test this hypothesis, the two negative values (“Effects on nature: Changes in biodiversity – positive consequences” and “Effects on the economy: economic benefits”) are summarised in a new index “Climate change has positive effects”. All positive values are summarised to a new index “Climate change has negative effects”. In addition, the index “Effects of climate change, in general”, with all indices from hypothesis 7, is used. Table 46 show that there were no significant differences in each of the three indices in the two countries before and after the environmental disaster (“Climate change has positive effects” (p = .60), “Climate change has negative effects” (p = .35), “Effects of climate change, in general” (p = .37)).

Table 46: Appearance of “causal interpretation (effects of climate change)” during the environmental disaster

Cluster	Germany			Australia		
	Before environmental disaster	After environmental disaster		Before environmental disaster	After environmental disaster	
	n = 112	n = 63		n = 112	n = 105	
	Mean (SD)	Mean (SD)	t-value/ significance	Mean (SD)	Mean (SD)	t-value/ significance
“Climate change has positive effects”	.03 (.16)	.01 (.30)	1.7 p = .09	.02 (.13)	.03 (.17)	-0.5 p = .60
“Climate change has negative effects”	.40 (.70)	.32 (.59)	0.85 p = .40	.44 (.83)	.54 (.84)	-0.9 p = .35
“Effects of climate change, in general”	.36 (.64)	.27 (.48)	1.0 p = .31	.37 (.64)	.45 (.69)	-0.9 p = .37

The hypotheses and sub research questions presented so far do not analyse the newspapers separately. This is why the last sub research question in this chapter focus on the frames and actors represented in each of the newspapers examined.

Sub research question 6: Was there a difference in framing of climate change in the four newspapers examined?

The seven clusters are now analysed to look at each of the four newspapers examined. The data demonstrates that *Frankfurter Allgemeine Zeitung*, on the one hand, clearly used a higher percentage of “Disconnected problem definition” than *Süddeutsche Zeitung* (49.0 per cent; *Süddeutsche Zeitung*: 42.9 per cent) as well as of “Sceptical Views” (11.1 per cent; *Süddeutsche Zeitung*: 6.2 per cent). Although the results of the literature review (see Chapter 3) show that the German way of dealing with critical voices in the climate change debate is usually ignoring them, because the German media agrees with the scientific consensus, *Frankfurter Allgemeine Zeitung* does provide more space for these voices. Comparing the “Sceptical views” cluster of *Frankfurter Allgemeine Zeitung* with the results of the two Australian newspapers – bear in mind that the theoretical findings show that the representation of climate-change-sceptical voices is common in Australian media –, *Frankfurter Allgemeine Zeitung* includes the cluster “Sceptics” more often (*The Sydney Morning Herald*: 8.1 percent; *The Age*: 7.2 per cent).

Süddeutsche Zeitung, on the other hand, demands “Focus on treatment information” (7.9 per cent; *Frankfurter Allgemeine Zeitung*: 4.0 per cent) and “Treatment recommendation international” (13.0 per cent; *Frankfurter Allgemeine Zeitung*: 8.1 per cent), i. e. calls for action on climate change stating that more information about climate change is needed and that the global community needs to tackle climate change.

In Australia, the greatest difference in percentage terms relates to “Focus on consequences, excluding effects on the economy” which appears in *The Sydney Morning Herald* in 22.1 per cent of articles (*The Age*: 14.3 per cent). Moreover, *The Sydney Morning Herald* referred more often to “Treatment recommendation national” (13.1 per cent; *The Age*: 11.0 per cent).

The Age, in contrast, prefers to refer to “Economic consequences”, with 10.7 per cent of media coverage with this frame (*The Sydney Morning Herald*: 7.0 per cent). Also “Disconnected problem definition” has a higher percentage in *The Age* (40.9 per cent; *The Sydney Morning Herald*: 35.6 per cent). The cluster “Treatment recommendation international” occurs slightly more often in *The Age* (6.6 per cent; *The Sydney Morning Herald*: 6.0 per cent). These results show that the two newspapers have a different emphasis, although both belong to the same media group: the *The Sydney Morning Herald* focuses on national activities and preferably represents causes and effects of climate change. *The Age* focuses on economic issues regarding climate change and a bit more on international action. The difference between the newspapers is highly significant ($p < .001$). Table 47 displays the results of all four newspapers examined for all seven clusters.

Table 47: The representation of climate change frames in the four newspapers examined

Cluster		Germany		Australia	
n=		177	198	298	335
		Süd- deutsche Zeitung	Frankfur- ter Allge- meine Zeitung	The Syd- ney Morn- ing Herald	The Age
“Disconnected problem defini- tion”	Number of articles (n)	76	97	106	137
	Percentage within a country	42.9	49.0	35.6	40.9
“Focus on conse- quences exclud- ing effects on the economy”	Number of articles (n)	34	33	66	48
	Percentage within a country	19.2	16.7	22.1	14.3
“Economic Con- sequences”	Number of articles (n)	10	14	21	36
	Percentage within a country	5.6	7.1	7.0	10.7
“Treatment rec- ommendation national”	Number of articles (n)	9	8	39	37
	Percentage within a country	5.1	4.0	13.1	11.0
“Treatment rec- ommendation international”	Number of articles (n)	23	16	18	22
	Percentage within a country	13.0	8.1	6.0	6.6
“Focus on treat- ment infor- mation”	Number of articles (n)	14	8	24	31
	Percentage within a country	7.9	4.0	8.1	9.3
“Sceptics”	Number of articles (n)	12	22	24	24
	Percentage within a country	6.2	11.1	8.1	7.2
Chi ² value	46.2	Significance		p < .001	

Sub research question 7: Which actors were covered in the context of climate change in the four newspapers examined?

In Germany and Australia, there is little difference in actors representing climate change. In the coverage in *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* in Germany as well as *The Sydney Morning Herald* and *The Age* in Australia there are similar frequencies of references to actors (see Table 48). Only in *Frankfurter Allgemeine Zeitung* there is a significant difference concerning “International actors” ($p < .01$). Thus, *Frankfurter Allgemeine Zeitung* sets climate change issues on the international political agenda.

Table 48: *Climate change actors represented in the four newspapers*

	Newspaper	Germany		Newspaper	Australia	
n =		375			637	
		Mean (SD)	t-value/ significance		Mean (SD)	t-value/ significance
"Scien- tists"	Süddeutsche Zeitung	.16 (.39)	1.3 (p = .19)	The Sydney Morning Herald	.25 (.47)	.26 (p = .79)
	Frankfurter Allgemeine Zeitung	.12 (.32)		The Age	.24 (.49)	
"Politi- cians"	Süddeutsche Zeitung	.11 (.31)	-0.6 (p = .57)	The Sydney Morning Herald	.30 (.53)	-1.0 (p = .33)
	Frankfurter Allgemeine Zeitung	.13 (.33)		The Age	.34 (.54)	
"Journal- ists"	Süddeutsche Zeitung	.47 (.50)	0.9 (p = .38)	The Sydney Morning Herald	.34 (.47)	-0.1 (p = .90)
	Frankfurter Allgemeine Zeitung	.42 (.50)		The Age	.33 (.47)	
"Economic actors"	Süddeutsche Zeitung	.10 (.30)	0.7 (p = .48)	The Sydney Morning Herald	.12 (.33)	0.4 (p = .70)
	Frankfurter Allgemeine Zeitung	.08 (.27)		The Age	.11 (.33)	
"Internat- ional ac- tors"	Süddeutsche Zeitung	.14 (.37)	-3.0 (p < .01)	The Sydney Morning Herald	.08 (.28)	-0.5 (p = .61)
	Frankfurter Allgemeine Zeitung	.12 (.52)		The Age	.10 (.30)	
"Civil soci- ety"	Süddeutsche Zeitung	.09 (.29)	1.0 (p = .29)	The Sydney Morning Herald	.11 (.34)	-1.5 (p = .12)
	Frankfurter Allgemeine Zeitung	.06 (.26)		The Age	.15 (.40)	

"Scientists": scale from 0-3; "Politicians": scale from 0-3; "Journalists" scale from 0-1; "Economic actors": scale from 0-2; "International actors": scale from 0-4; "Civil society": scale from 0-2

7. Climate change research since 2011

The findings presented in the last Chapter show the situation in the years 2007 to 2011. Since then a variety of research has been published. This chapter examines these research activities in Germany and Australia. The goal of this chapter is to classify the results of this research in the current research context.

Analysing the research on climate change after 2011, it appears that there was less research on climate change coverage. The research interest shifted to the public's attitudes to climate change and to online media (see, for example, Metag et al. 2015, Lörcher and Taddicken 2017, Morrison et al. 2013, Jang and Heart 2015).

German climate change studies are first discussed, followed by a review of Australian research since 2011.

7.1. German climate change studies since 2011

In their research, Metag et al. (2015) and Lörcher and Taddicken (2017) focus on the public's attitude to climate change. However, they used different methods for their analysis.

Based on Maibach et al.'s (2011) "Global Warming's Six Americas", Metag et al. (2015) conducted a nationwide computer-assisted telephone interview with 3,000 Germans aged 18 and older, asking during a period of moderate social interest in climate change about their attitude to this issue (p. 5). Based on 39 questions (Metag et al. 2015, p. 6) the results were condensed to 26 items representing seven factors (Metag et al. 2015, p. 9). These seven factors, covering 1,943 cases, were used for a cluster analysis resulting in five clusters representing types of attitudes among the German population: the *Alarmed* (n=459, 24 per cent) who are "...strongly concerned about climate change as well as the environment in general", the *Concerned Activists* (n = 349, 18 per cent) who "...are concerned about climate change – albeit less so than the *Alarmed* – and translate this concern in to action", the *Cautious* (n = 543, 28 per cent), "...their concern is not strong and does not translate into action", the *Disengaged* (n = 389, 20 per cent) who "...are concerned about climate change but show the lowest environmental concern..." and the *Doubtful* (n = 201, 10 per cent) who "...are not concerned about climate change at all and are sceptical that it exists or that it is caused by humans" (Metag et al. 2015, pp. 10 f.).

Metag et al. (2015) also analysed the sources of information that these five types of attitudes are based on: The *Alarmed* use television, believing that it is the most reliable medium because it is up-to-date and precise (p. 11), the *Concerned Activists* mainly use television, followed by newspapers and radio as well as the internet (p. 11), the *Cautious* use television and their use is average (pp. 11 f.), the *Disengaged* “...do not seek information about climate change very often. If they do, they mainly use TV and tabloid newspapers” (p. 12), and the *Doubtful* scored the lowest on seeking information about climate change, but if they do receive information, it reaches them via TV, the daily newspaper, or the radio (p. 13).

Metag et al.’s (2015) results related to sources of information identify the *Concerned Activists*, the *Disengaged*, and the *Doubtful* as newspaper readers (p. 10). For this research, which examines quality newspapers, only the *Concerned Activists* and the *Doubtful* seem to be important groups, i. e. groups which prefer daily newspapers for information – daily newspapers are also analysed in this research – and either call for climate change action or profess ignorance of climate change. These two positions are, however, only rudimentarily represented in the four newspapers which are examined for this research. This could mean two things: first, that the climate change coverage might not have any effect or, second, that climate change coverage has changed since the period in which this research was carried out. The latter would, however, mean that climate change coverage has changed in two contrasting ways since the research period ended: on the one hand, those who are concerned about climate change and want to tackle it are represented in coverage, while, on the other hand, climate change sceptics are also heard.

Lörcher and Taddicken (2017) analysed the public’s climate change discourse on the internet, using a quantitative manual and automated online content analyses, examining the mass media arenas *Spiegel.de*, *Welt.de*, the expert arenas *Klimazwiesel* as well as *Klimalounge* and the mass-media-induced discussion arenas *Comments Spiegel.de* and *Comments Welt.de* (pp. 6-7). The research started from one week prior until one week after the release of the IPCC report (16 September 2013 to 7 October 2013), a period which was chosen by the authors because “...it triggers huge levels of public attention” (Lörcher and Taddicken 2017, p. 6). The relevant posts were identified via a web-crawler developed for this research project and were manually controlled before the analysis; 5,301 units of investigation were found (Lörcher and Taddicken 2017, p. 7). The authors used these units to identify the “Plurality of topics”, “Causes, consequences, mitigation and adaptation measures”, “Climate change Skepticism”, and “(Un)certainty and (lack of) credibility” (Lörcher and Taddicken 2017, pp. 10 f.).

Concerning the “Plurality of topics”, the authors discovered that the mass media mainly refer to the “IPCC report” itself (49 per cent), followed by “Climate Policy” (39 per cent), “Climate Science” (22 per cent), “Economy and Climate Change” (10 per cent), “Citizen activity and Climate Change” (7 per cent), “Media/culture/arts/celebrity and climate change” (5 per cent) and “Topic without reference to Climate Change” (2 per cent) (Lörcher and Taddicken 2017, p. 10). The expert arena mainly examined “climate science” (54 per cent), the “IPCC report” itself (30 per cent) and “Media/culture/arts/celebrity and climate change” (16 per cent) (Lörcher and Taddicken 2017, p. 10). And the mass-media-induced discussion arena concentrated on “Science and Climate Change” (37 per cent), “Topic without reference to Climate Change” (17 per cent), “Economy and Climate Change” as well as “Citizen activity and Climate Change” (16 per cent each), “Media/culture/arts/celebrity and climate change” (13 per cent) and “IPCC report” (10 per cent) (Lörcher and Taddicken 2017, p. 10).

Looking at “Causes, consequences, mitigation and adaptation measures”, Lörcher and Taddicken (2017) found this issue most frequently mentioned in the mass media arena (Causes: 68 per cent, Consequences: 61 per cent, Mitigation/adaptation measures: 71 per cent), then in the expert arena (Causes: 20 per cent, Consequences: 39 per cent, Mitigation/adaptation measures: 7 per cent), and last frequently in the mass-media-induced discussion arena (Causes: 5 per cent, Consequences: 5 per cent, Mitigation/adaptation measures: 6 per cent) (p. 11).

“Climate change Skepticism” was mostly found in the mass-media-induced discussion arena (Existence of climate change: 37 per cent, Anthropogenic climate change: 9 per cent, Evaluation of consequences: 2 per cent), whereas the communicators in the mass media (Existence of climate change: 88 per cent, Anthropogenic climate change: 68 per cent, Evaluation of consequences: 58 per cent) and the expert arena (Existence of climate change: 39 per cent, Anthropogenic climate change: 21 per cent, Evaluation of consequences: 13 per cent) are convinced of anthropogenic climate change and its negative consequences (Lörcher and Taddicken 2017, p. 11).

In terms of “(Un)certainty and (lack of) credibility”, Lörcher and Taddicken (2017) discovered that the mass media arena included a high degree of (un)certainty (87 per cent; (Lack of) credibility: 33 per cent), followed by the mass-media-induced discussion arena ((Un)certainty: 53 per cent; (Lack of) credibility: 55 per cent), and the expert arena ((Un)certainty: 28 per cent; (Lack of) credibility: 25 per cent) (p. 12).

For Lörcher and Taddicken (2017), these results show “...that climate change is mainly discussed as a scientific issue” and that “...German online climate change communication reflects the consensus on anthropogenic climate change” (p. 14). The authors, however, also say that “there is a greater diversity of topics in the mass-media induced discussion arena” (Lörcher and Taddicken 2017, p. 14). More concretely, they say that “...laypeople have their own way of ‘down-scaling’ the scientific issue climate change” and that “most climate change scepticism... was found in the mass-media-induced discussion arena – more precisely in Welt.de user comments” (Lörcher and Taddicken 2017, p. 14).

Concentrating on the mass media arena, which is mostly comparable with the newspapers analysed in this research, it has the highest amount of coverage related to “Plurality of topics” and “Causes, consequences, mitigation and adaptation measures” whereas “Climate change Skepticism” only plays a minor role. These results are similar to those found in this research. Regarding “(Un)certainly and (lack of) credibility”, the mass media arena is also ranked first. However, this discourse is not transparent enough to get an impression of what this result really means: the question whether there is certainty or uncertainty, credibility or lack of credibility when it comes to climate change is not answered.

More comparable to this research is the work of Brüggemann and Engesser (2017) and of Kaiser and Rhomberg (2016).

Brüggemann and Engesser (2017) analysed how the IPCC stance on climate change and its challenges are covered in the media of Germany, India, the United Kingdom, the United States and Switzerland (p. 58). The authors define the IPCC stance on climate change as follows:

“(1) Global warming represents an extraordinary rise in average global temperatures since the industrial revolution. (2) It is mainly caused by human-induced emissions of CO₂ and other greenhouse gases. (3) It creates problems for both ecosystems and humanity. (4) Emissions need to be reduced to avoid future damage” (Brüggemann and Engesser 2017, p. 59).

The study is based on a content analysis published in two upmarket newspapers (right leaning as well as left leaning), one mass market or midmarket newspaper, one regional newspaper from a complementary metropolitan area, and one major online news outlet (Brüggemann and Engesser 2017, pp. 58 and 61). It includes all types of content, all kinds of contributors of news content and examines articles published online as well as paper formats from 1 January 2011 to 31 December 2012 (Brüggemann and Engesser 2017, pp. 60 f.).

Three research questions are discussed: 1. To what degree is the climate change frame challenged in international media coverage by expressing contrarian viewpoints? 2. How do journalists treat contrarians as voices in journalistic coverage (quotes and evaluations)? And 3. How can (a) different degrees of challenging the climate change consensus and (b) different ways of dealing with contrarians in journalistic coverage be explained? (Brüggemann and Engesser 2017, p. 60).

The research done by Brüggemann and Engesser (2017) identified the authors of climate change articles as specialised journalists as well as those who occasionally wrote about the topic and then searching for the keywords ‘climate change’ or ‘global warming’ or ‘greenhouse effect’ (and their equivalents in German) online as well as in the print versions of the chosen newspapers, using *LexisNexis* and *Factiva* (p. 61). The search generated a sample of 170 climate journalists, who were invited by email to participate in the bilingual (English and German) online survey (27 September to 10 October 2012); a sample of 62 journalists completed the questionnaire (Brüggemann and Engesser 2017, p. 61). Then the authors matched the survey respondents with their articles, resulting in a sample of 936 articles (Brüggemann and Engesser 2017, p. 61). This sample of the content analysis ($n = 936$) covered the years 2011 and 2012, “... which represents a period of modest and routine coverage of climate change” (Brüggemann and Engesser 2017, p. 61), including two UN climate summits, COP 17 and COP 18, two special IPCC reports, a couple of extreme weather events, such as a hot summer in the United States in 2011 and a hot spring in Europe in 2011, as well as hurricanes Irene and Katia (Brüggemann and Engesser 2017, p. 61). By analysing the amount of coverage, Brüggemann and Engesser (2017) discovered that “...the most important news pegs were the publication of scientific studies (32%) and...the actions of domestic governments (16%)” ($n = 936$ articles) (p. 61). Other stimuli for climate change coverage were the COPs which received 18 per cent coverage and weather events which were reported in 6 per cent of the articles reviewed, whereas the special IPCC reports (1 per cent coverage) were mostly ignored (Brüggemann and Engesser 2017, p. 61).

For Germany, Brüggemann and Engesser (2017) examined the newspapers *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung* (Upmarket newspaper), *Bild-Zeitung* (Mass-/midmarket newspaper), *Berliner Zeitung* (Regional newspaper), and *Spiegel-Online* (Major online news outlet) (p. 61).

Brüggemann and Engesser (2017) conducted a content analysis and coded whether any of the above-mentioned statements was explicitly ‘challenged’ (data value = -1), ‘balanced/not mentioned’ (data value = 0), or ‘mentioned/supported’ (data value = 1), summarising the results in an “IPCC index” (p. 61). The authors found an “IPCC index” of .60 of all cases

and evaluated a stance of $-.04$ in terms of contrarian voices (Brüggemann and Engesser 2017, p. 63). *Bild-Zeitung*, in particular, raised doubts about climate change, represented, for example, by the views of the former German politician Fritz Vahrenholt, with more than 10 per cent of the articles challenging the climate change consensus (Brüggemann and Engesser 2017, p. 64). Only 4 per cent of the German articles included contrarian voices (Brüggemann and Engesser 2017, p. 63). In addition, the authors discovered that the contrarian voices challenged “Anthropogenity” as well as “Risks” in 4 per cent of all articles, “Emission reduction” in 2 per cent and “Global warming” in 1 per cent of all articles ($n = 201$ articles) (Brüggemann and Engesser 2017, p. 63).

The findings of Brüggemann and Engesser (2017) corroborate the results introduced from Metag et al. (2015) 10 per cent of their respondents are *Doubtful* and “...are sceptical that it [climate change] exists or that it [climate change] is caused by humans” (Metag et al. 2015, pp. 10 f.). This research, in addition, shows that there are no differences in terms of sceptical voices in Germany and Australia, although Australian newspapers were expected to give sceptics more of a say in the media.

Kaiser and Rhomberg (2016) used a broader range of German print media in their study about climate-change scepticism in Germany during the COP 17 (p. 557). The authors conducted an explorative content analysis “...to demonstrate 1. how sceptical arguments and critical undertones are reported and 2. to identify possible sceptical frames” (Kaiser and Rhomberg 2016, p. 558). For Kaiser and Rhomberg (2016) climate scepticism is understood “...as either the questioning of the existence of climate change, its anthropogenic cause, its dangerous impacts or the science behind it, or any combination of these factors” (p. 559).

As a method, Kaiser and Rhomberg (2016) used a two-step content analysis with, first, a qualitative coding process and then quantitative content analysis of the media debate (p. 561). An explorative approach helps to identify elements of ideas, which are aggregated to frames and, then, abstracted to media packages (Kaiser and Rhomberg 2016, p. 561). “Each idea element is attached to one frame and each frame is attached to one media package. ...The packages provide meaning to an issue” (Kaiser and Rhomberg 2016, p. 561). The chosen newspapers were *Frankfurter Allgemeine Zeitung*, *Süddeutsche Zeitung*, *Die Welt*, *die tageszeitung*, *Handelsblatt* as well as *Die Zeit* and the weekly magazine *Der Spiegel*, including the online outlets of all media (Kaiser and Rhomberg 2016, p. 561).

Kaiser and Rhomberg (2016) just used “Durban [Durban]” and “Klima [climate]” as search terms and collected articles from databases such as *LexisNexis* and the newspapers’ official

archives (p. 562). The articles were restricted to the period two weeks before and after the conference (14 November 2011 to 25 December 2011) (Kaiser and Rhomberg 2016, p. 652).

For a first and explorative step of the content analysis, a random sample of 25 per cent ($n = 95$ articles) were examined in order to find sceptical statements about climate change or climate science, including journalists' evaluations (Kaiser and Rhomberg 2016, p. 562). "This was in order to not overeagerly discard possible frames and additionally to present the variety of sceptical elements within the German news media's reporting on COP17" (Kaiser and Rhomberg 2016, p. 562). The authors then clustered specific statements from the articles and transformed them into "idea elements" (Kaiser and Rhomberg 2016, p. 562). Moreover, Kaiser and Rhomberg (2016) added further prominent idea elements from the literature (p. 562). Altogether, the authors found 379 articles which were coded by three coders (Kaiser and Rhomberg 2016, p. 562).

Kaiser and Rhomberg's results (2016) show that 52 articles out of 379 included 122 sceptical statements, which is 15 per cent of all articles (p. 563). The 122 sceptical statements were summarised, first, into 31 idea elements and, second, to seven frame packages, which are "Existence", "Causes", "Impact", "Politicization", "Uncertainty", "Alarmism", and "Conspiracy" (Kaiser and Rhomberg 2016, p. 563). These seven frame packages were then summarised in two media packages, linking scepticism with 1. the phenomenon of climate change and 2. with climate science (Kaiser and Rhomberg 2016, p. 563). "We found 38 articles with skeptical elements regarding the phenomenon of climate change, 28 with skeptical elements regarding climate science, and 14 that included both media packages" (Kaiser and Rhomberg 2016, p. 563).

Because Kaiser and Rhomberg (2016) carried out an explorative study, the idea elements and frame packages were created by, first, identifying relevant statements which were sceptical of climate change or climate science, second, listing all relevant sentences and, third, discussing the list of quotes in a group until each idea element was identified (p. 563).

The most prominent idea elements were "questioning climate change's existence" ($n = 12$), "questioning mankind's influence" ($n = 10$), "denial of climate change" ($n = 8$), and the idea that "CO₂ is not to blame" ($n = 8$), which were mainly found in the print media (80 idea elements; while 42 idea elements were found in online articles) (Kaiser and Rhomberg 2016, p. 564).

The two authors clustered the established idea elements into two frame packages: The first dealt with the questioning of the phenomenon of climate change (including the idea elements: "Existence", "Causes", "Impact") ($n = 48$), and the second media package related to

scepticism with regard to climate science (including the idea elements: “Politicization”, “Uncertainty”, “Alarmism”, and “Conspiracy”) (n = 46) (Kaiser and Rhomberg 2016, pp. 565 f.). A remarkable finding by Kaiser and Rhomberg (2016) is that the liberal *Die Zeit* included as many sceptical frames (n = 25) as the conservative daily *Die Welt* (n = 26). *Die Welt* and the tabloid *Bild* share the same media owner; however, *Bild* included just one sceptical voice (Kaiser and Rhomberg 2016, p. 565). Nevertheless, there are some obvious differences in the representation of climate-change-sceptical opinions: *Die Zeit* focused on the existence of climate change (n = 16), whereas *Die Welt* mainly discussed the causes of climate change (n = 14) evaluating climate-change-sceptical ideas positively (n = 36), *Frankfurter Allgemeine Zeitung* also has a positive connotation relating to climate-change-sceptical ideas (n = 14), and *Süddeutsche Zeitung* evaluated six frames positively and six negatively (Kaiser and Rhomberg 2016, p. 566). Altogether, Kaiser and Rhomberg’s data set (2016) was – as it is also the case with the sceptical voices in this research – very small and might not produce reliable results.

In addition to identify sceptical statements, Kaiser and Rhomberg (2016) also examined the evaluation of climate-change-sceptical opinion, discovering that 50 per cent of the statements (n = 61) were evaluated positively, the sceptical message is, consequently, preferred, whereas 39.3 per cent of the statements (n = 48) were evaluated negatively, and 10.7 per cent (n = 13) were not evaluated clearly (p. 566).

Looking at the differences between the analysed newspapers, the authors discovered that *Die Welt* evaluated none of all 40 idea elements negatively (4 neutrally and 36 positively) and is, thus, supportive of sceptical ideas, *Die Zeit* evaluated only 2 of 32 idea elements positively (3 neutrally, 27 negatively), *Frankfurter Allgemeine Zeitung* evaluated 14 of its 23 sceptical idea elements positively (2 neutrally, 7 negatively), *Süddeutsche Zeitung* evaluated six idea elements positively and six negatively (Kaiser and Rhomberg 2016, p. 566).

Kaiser and Rhomberg (2016) further claim that their results indicate that there was “...a slight correspondence between the political leaning of a media outlet and the use of sceptical frames” (p. 567) and, because they did not find any “genuine German sceptical idea elements or frames” (p. 568), they summarise that “...climate change scepticism is a transnational Western phenomenon embedded in the national context” (p. 568). This finding corresponds to the results of this research: although the literature predicted that Australia would have much more sceptical voices in climate change coverage than Germany, the analysis did not identify any differences between the two countries although their climate is that different (see Chapter 6.2.1/Hypothesis 3). Thus, there seems to be some kind of obligation to also represent sceptical voices in the climate change discussion.

Kaiser and Rhomberg (2016), however, remark that sceptical frame elements "...are rare and unequally distributed and thus hard to interpret" (p. 568). The findings of this research underpin the statement of Kaiser and Rhomberg (2016). With a percentage of 8.8 per cent of the German climate change coverage and 7.6 per cent of the Australian climate change coverage (see Chapter 6.2.1/Hypothesis 3), sceptical voices are rare. However, statements, such as "[Cardinal George] Pell, on the other hand, clings to the fashionable right-wing credo that global warming is fraud" (SMH, 19.3.2011) as well as "But a group of physicists with strong links to the Republican White House cherry-picked one section of a Hansen graph and used it to misleadingly claim in Washington that it showed the warming was solely due to the sun." (The Age, 13.11.2009) (see all examples in Tables 15 to 19 and 29) can only be interpreted as sceptical.

Wessler et al. (2016) ask for Germany: "To what degree does a unique global political media event such as a COP entice cross-national similarities in multimodal framing that supersede country-specific context factors?" (p. 424). To answer this question, the authors did a comparative multimodal frame analysis which consists, on the one hand, of an analysis of news visuals which are "...of great importance in globalized news production because they are often provided by globally operating news image agencies" (p. 425) and, on the other hand, an examination of written news texts "...for contextualizing news photos through the presentation of speakers and arguments in line with national particularities" (Wessler et al. 2016, p. 426).

The methodological approach taken in Wessler et al.'s (2016) content analysis included all three types of semiotic resources, i. e. 1. Textual-typographical (the written words of a news item), 2. Pictorial-representational (news photos), and 3. diagrammatic-representational (charts, diagrams, or maps) (p. 426). The research period covered the UN climate change conferences in Cancún, Mexico (COP 16, 2010), in Durban, South Africa (COP 17, 2011), in Doha, Qatar (COP 18, 2012), and in Warsaw, Poland (COP 19, 2013). Widely read daily newspapers in Brazil (*Folha de Sao Paulo*, *O Globo*), Germany (*Süddeutsche Zeitung*, *Frankfurter Allgemeine Zeitung*), India (*Times of India*, *The Hindu*), South Africa (*Daily Sun*, *The Star*), and the United States (*New York Times*, *Washington Post*) were analysed (Wessler et al. 2016, p. 427). A requirement for selection was that an article either had to be highlighted by a layout element referring to a climate conference or had to mention one of the following keywords in the article's headline, sub-headline, visual caption, or text body: climate change, global warming, Cancun, Durban, Doha, Warsaw, greenhouse effect, Kyoto Protocol, climate summit, climate conference, climate talks, climate politics, or climate science (Wessler et al. 2016, p. 427). Altogether 1,311 text-based articles were found and three

strategies were used of which, in strategy 1, only those text-based articles that were illustrated by at least one photograph or photomontage ($n = 432$) were considered and, in strategy 2, all text-based articles were taken ($n = 1,311$) to test whether the frame structure found in the multimodal articles re-emerged in the entire set of articles, or whether there were distinct nonvisual or text-only frames (Wessler et al. 2016, p. 428). In strategy 3, again the subsample of photo-illustrated articles ($n = 432$) were used to test for all five countries whether the frames – found across newspapers from five countries – could also be found when clustering articles within the country-specific subsamples (Wessler et al. 2016, p. 428). Each article was first segmented into statements attributed to actors ($n = 5,561$): “A statement contained either 1. an utterance made by an identifiable individual, collective, or institution (in a direct quote or indirectly paraphrased) or 2. information provided by the author of the article (most often a journalist)” (Wessler et al. 2016, p. 428). All statements were then coded in terms of the presence or absence of a predefined set of climate-change-related frame elements (Wessler et al. 2016, p. 428).

The coding was based on Entman’s definition for framing, using, first, the frame dimension “problem definition” for the consequences of climate change, such as increases in temperature, melting ice/glaciers, etc., second, identifying “causes” for issues, such as greenhouse gas emissions, deforestation and, third, “treatment recommendations” for remedies, such as clean energy, a global climate treaty, financial assistance to disadvantaged countries, etc. The frame dimension “moral evaluation” was used as contextual information only (Wessler et al. 2016, pp. 428 f.).

When coding images, the coders had the opportunity to code multiple image content categories for a single visual (Wessler et al. 2016, p. 429). Six coders with near-native speaker status in at least two of the languages involved (English, German, and Portuguese) were trained (Wessler et al. 2016, p. 429). Hierarchical cluster analyses of the textual and visual content data were conducted to explore the coverage for distinct multimodal frames of climate change, using “0” for “frame element absent in article” and “1” for “frame element present in article”, and, for strategy 3, frequency analyses were conducted for each country subsample separately (Wessler et al. 2016, p. 430).

For each of the three strategies a separate hierarchical cluster analysis was conducted which – to determine the structural compositions of these clusters, i. e. the news frames – cross-tabulated the cluster affiliations of the articles with the individual frame elements (Wessler et al. 2016, p. 430).

The results of strategy 1 were 432 photo-accompanied articles, including four multimodal frames:

1. the “global warming victims” frame (36 per cent), which emphasises all possible consequences of climate change, with the increase in temperature appearing most prominently (71 percent),
2. the “civil society demands” frame (29 per cent), focusing on the full range of potential remedies for climate change effects: from the mention or explicit endorsement of clean energy (61 percent) through financial help for disadvantaged countries (48 percent) and the adoption of a new binding global treaty to reduce carbon emissions (44 percent) to reforestation/prevention of further deforestation (21 percent),
3. the “political negotiations” frame (12 per cent), emphasising issues, with clean energy being the most salient (40 percent) alongside the adoption of a new binding treaty (28 percent), while the explicit endorsement of financial help for disadvantaged countries stands out in this frame (26 percent), as does the call for action in general (22 percent), and
4. the “sustainable energy” frame (23 per cent), looking at the core narrative of the climate change debate, in which fossil fuels and the resulting greenhouse gas emissions are the central cause (72 percent) of an increase in temperature (29 percent) (Wessler et al. 2016, p. 430).

Concentrating on the results for Germany when looking at the appearance of these frames in the 432 photo-accompanied articles, which were examined, altogether 127 articles were analysed in the two German newspapers with 42.5 per cent ($n = 54$) of articles with a “global warming victims” frame, 22.8 per cent ($n = 29$) of articles with a “civil society demands” frame, 10.2 per cent ($n = 13$) of articles with a “political negotiation” frame, and 24.4 per cent ($n = 31$) of articles with a “sustainable energy” frame (Wessler et al. 2016, p. 434).

The most predominant German frame – the “global warming victims” frame – as well as the second dominant frame – the “sustainable energy” frame – both deal with the issue of temperature increase, either as an increase in temperature as a consequence of climate change or as an increase in temperature due to a certain reason, for example, greenhouse gas emissions. This work also looks at frames/frame sub-dimensions of causes and effects (see hypothesis 1: Germany: $n=169$, Australia: $n = 342$) (see Chapter 6.2.1). With its hypotheses 1, 8, 10 as well as sub research question 5, it examines how these frame sub-dimensions (partly clustered to frames or summarised to new indices) appear in the articles analysed. In this work, the findings, however, show that Germany’s climate change coverage, compared to that in Australia, did not indicate a significant difference between frames for climate causes

and consequences. But Wessler et al.'s (2016) findings are not comparable to the results of this research because this would entail a comparison between visual and textual frames.

Strategy 2 produced 1,311 articles which were also clustered in four frames. The “global warming victims” frame and the “sustainable energy” frame remained virtually unchanged in terms of the composition of frame elements (Wessler et al. 2016, p. 433). However, the “civil society demands” and the “political negotiations” frames appeared as one new frame – the “political dispute” frame, and a new fourth frame emerged, which was described as the “common sense” frame (Wessler et al. 2016, p. 433). This was least distinctive due to only three out of 34 frame elements appearing in more than 20 per cent of all examined articles (Wessler et al. 2016, p. 433). Articles in this cluster were shorter, contained fewer visual elements (26.5 per cent vs. 43 per cent of articles in the other clusters), and were opinion (27 per cent) rather than fact-based (17 per cent) (Wessler et al. 2016, p. 434). The distribution of the four frames was relatively similar across the five very different countries, which Wessler et al. (2016) considered an important result, because the authors discovered that about 85 per cent of the multimodal articles were originally produced by staff members of each newspaper (pp. 434 f.).

The overall frame distribution pattern becomes clearer when computing and comparing *country-specific* cluster solutions with a hierarchical cluster analysis (strategy 3). The “...results vary across countries as regards the number of statistically recommended frames as well as their specific configurations. The Indian and the U.S. subsamples show the strongest similarities...” (Wessler et al. 2016, p. 435).

With strategy 3, the German sample resulted in only three cluster solutions (Brazil had the most cluster solutions, i. e. six frames) which were “victims and remedies” (60 per cent), including the issues fossil fuels, increase in temperature, clean energy endorsed, new treaty endorsed, no action rejected and new treaty mentioned, “global warming victims” (48 per cent), including increase in temperature, natural landscape (from the visual frame analysis), clean energy endorsed, melting ice/rising sea levels, extreme weather and societal consequences, and “sustainable energy” (44 per cent), including clean energy mentioned, fossil fuels, clean energy endorsed, increase in temperature, financial assistance mentioned, new treaty mentioned (Wessler et al. 2016, pp. 436 ff.).

Summarising Wessler et al.'s (2016) “victims and remedies” frame explains the consequences as well as the action needed to tackle climate change, while their “global warming victims” frame mainly discussed the negative consequences of climate change, and their “sustainable energy” frame referred to energy sources, costs and policies. So, like Lörcher

and Taddicken (2017), Wessler et al. (2016) identified frames which refer to climate change effects, consequences and action in the German media.

This work also looks at climate effects, consequences and action. Its cluster “Climate Effects and Action” (Hypothesis 1), however, focuses on other aspects than Wessler et al. (2016). On the one hand, it differentiates between a climate change perspective with the frame “Focus on consequences excluding effects on the economy” (including “Causes of climate change”, “Effects on nature”, “Effects on weather”, and “Effects on humans”) and an economic perspective on climate change with the frame “Effects on the economy”. So, climate change and economic aspects are not mixed up as in Wessler et al.’s “victims and remedies” and “sustainable energy” frame. On the other hand, it includes climate action frames asking for national action (“Treatment recommendation – national”), international action (“Treatment recommendation – international”) as well as for more information about climate change (“Focus on treatment information”). These different perspectives of action are not identified by Wessler et al. (2016).

However, a conspicuous finding by Wessler et al. (2016) is that “...the national context in which multimodal articles on the climate conferences are produced does not automatically lead to vastly different national framings” (p. 440) and that “...the cross-national similarity ... can be interpreted as the outcome of a shared globalized production environment that journalists encounter at global events” (p. 440). As the results of this research only show minor differences in the climate change coverage between Germany and Australia, this statement by Wessler et al. (2016) can be extended to assume that there is a general shared globalised production environment when it comes to climate change coverage.

Extending Wessler et al.’s (2016) research, Lück et al. (2018) look for similarities and differences in the media coverage of climate change in Brazil, Germany, India, South Africa, and the USA during various United Nations Climate Change Conferences (COP’s) looking at issue frames and narratives. (p. 3). “We argue that issue frames may be more similar across countries than narratives” (Lück et al. 2018, p. 3), because, different to frames, narratives are connected with the country’s culture (Lück et al. 2018, p. 4). Lück et al. (2018) emphasise that there is a connection between frames and narratives which is dynamic and non-deterministic (p. 7), but that it is not clear whether these relationships are similar across all defined countries (p. 8).

Lück et al. (2018) look at frames and narratives during the COP’s in Cancún, Mexico, Durban, South Africa, and Doha, Qatar (p. 10), all international events, which are assumed as

having the same media attention worldwide (p. 9). In addition, the authors say that the journalists, who work at these international COP's, get the same information as well as work in the same setting, facing several interest groups who want to get their strategic interests into the media to gain public attention (Lück et al. 2018, p. 9).

Therefore, Lück et al. (2018) analyse the newspapers "Folha de São Paulo" and "O Globo" for Brazil, "Süddeutsche Zeitung" and "Frankfurter Allgemeine Zeitung" for Germany, "Times of India" and "The Hindu" for India, "Daily Sun" and "The Star" for South Africa, as well as "The New York Times" and "The Washington Post" for the United States of America (p. 10), 1,311 articles altogether (p. 11), testing the following hypotheses:

"H1: The narrative story types used in COP coverage will be more distinct between countries than the issue frames applied.

H2: A particular issue frame will be combined with different story types in different countries, reflecting country-specific patterns of narrative coloring even for the same issue frame" (p. 9).

To answer these hypotheses, Lück et al. (2018) coded "all actor-statements (including statements of the article's authors, mostly journalists)" (p. 11) looking at the frame elements – according to Entman's (1993) definition – "problem definition (here: consequences of climate change, such as increases in temperature, melting ice/glaciers, etc.)", "identification of causes (e.g., greenhouse gas emissions, deforestation)", and "treatment recommendations (remedies, such as clean energy, financial assistance to disadvantaged countries etc.)" (n=5,561) (p. 11).

Narratives were coded in terms of "degree of narrativity", "story type", and "narrative roles": the "degree of narrativity" identifies "dramatization", "emotion", "narrative personalization" as well as "fictionalization" (Lück et al. 2018, p. 12). The "story type" consists of "overall theme", "tone" and "outcome", the "narrative roles" could be "one hero", "one victim" and "one villain" per article and looks at the type of actor as he/she is "individual", "organizational", or "institutional", the name of the actor and his/her activities in terms of climate change (Lück et al. 2018, p. 12).

Generally, Lück et al. (2018) found out that the degree of narrativity is the highest in Brazil, followed by Germany, the United States of America, South Africa, and India (p. 13). The narrative variables were then clustered resulting in the clusters "Ongoing Conflict" (32.4 per cent of all articles), "Catastrophe" (20.9 per cent), "Hopeful Struggle" (17.8 per cent), "Business as Usual" (14.0 per cent), and "Stories of Success" (13 per cent) (p. 14). "Political or

social conflicts dominate the theme variable in the ‘Ongoing Conflict’ narrative” (Lück et al. 2018, p. 14). Almost all articles with the “Catastrophe” narrative are pessimistic (Lück et al. 2018, p. 15). The “Hopeful Struggle” narrative refers to the hope to tackle climate change (Lück et al. 2018, p. 15). The “Business as Usual” cluster conveys the image of climate change as a routine business, using an unexcited or neutral tone (Lück et al. 2018, p. 15). And the “Success Stories” cluster includes articles talking about climate change conflicts which are solved in the end (Lück et al. 2018, p. 15 f). For Germany, 348 articles were identified of which 36.5 per cent include the “Ongoing Conflict” story type, 19.0 per cent the “Catastrophe” story type, 14.4 per cent the “Hopeful Struggle” story type, 19.3 per cent the “Business as Usual” story type, and 10.9 per cent the “Success Stories” story type (Lück et al. 2018, p. 32)

Looking at Germany regarding the “narrative role”, victims as well as villains are “others”, such as developing countries, other countries, poor countries and so forth: “...responsibility is generally assigned to someone else but the own country” (Lück et al. 2018, p. 17), whereas the “one hero” are Western countries or individuals (Lück et al. 2018, p. 17).

For examining the framing, Lück et al. (2018) use the identified 22 text-based and 12 visual frame elements for another cluster analysis with four clusters as a result: the “Global Warming Victims” frame, the “Political Dispute” frame, the “Sustainable Energy” frame, and the “Common Sense” frame (p. 18).

73 per cent of the “Global Warming Victims” talk about the consequences of global warming, focussing on extreme weather and societal consequences (50 per cent) (Lück et al. 2018, p. 18). The “Political Dispute” frame looks at political activities and policies in the context of the COP’s (Lück et al. 2018, p. 19). The “Sustainable Energy” frame identifies fossil fuels as a cause of climate change in 50 per cent of all articles and asks for clean energy (Lück et al. 2018, p. 19). And the “Common Sense” frame stands for common issues, for example, temperature increase as a consequence of climate change, fossil fuels as a cause of climate change, and clean energy as an activity to tackle climate change (Lück et al. 2018, p. 19). These findings of Lück et al. (2018) show that “...hypothesis 1, according to which country differences in framing should be smaller than differences in story types used, is well supported” (p. 20).

At the end of their research, Lück et al. (2018) looks at the relationship between the found narrative and frame clusters. The “Global Warming Victims” frame is connected with the “Ongoing Conflict” narrative in 35.1 per cent of all articles (Lück et al. 2018, p. 20 and 34). In the two German newspapers ($n = 74$), the “Ongoing Conflict” narrative refers to other

countries (Lück et al. 2018, pp. 20 and 34). The “Hopeful Struggle” narrative is used by all countries almost to the same extent (Germany: 21.2 per cent) (Lück et al. 2018, p. 21). All other narratives appear on a very low level.

In the German coverage the “Political Dispute” frame also mainly includes the “Ongoing Conflict” narrative (39.0 per cent) (Lück et al. 2018, pp. 22 and 34). The “Business as Usual” narrative (22.0 per cent) and the “Catastroph” narrative (20.7 per cent) appear equally in Germany (Lück et al. 2018, p. 34).

Within the “Sustainable Energy” frame, the “Ongoing Conflict” narrative is also the most often used narrative in Germany (28.9 per cent) (Lück et al. 2018, p. 22). “For Germany, having to face the ongoing challenge of the ‘Energiewende’ (energy turnaround), issues of sustainable energy are still a matter of political conflict...” (Lück et al. 2018, p. 22).

The “Common Sense” frame is the most dominant frame (Germany: $n = 142$) with the “Ongoing Conflict” narrative as a main issue, as well; Germany rank this narrative highest with 35.5 per cent, second is the “Hopeful Struggle” narrative (26.1 per cent) (Lück et al. 2018, p. 23).

The authors, moreover, conclude that differences in narratives are based on the journalistic traditions of a country, the story type identifies national views on climate change and climate politics (Lück et al. 2018, p. 23). Framing, however, is not that strong connected with a country: “It transcends cultural borders especially in cases like the COP’s that are focal points for global attention to an issue...” (p. 24). This finding is confirmed by this work due to the fact that the differences in framing between Germany and Australia are only little.

With their findings about narratives and issue frames, Lück et al. (2018) “...observe a trend towards homogenization of content production...” (p. 24) – or as Wessler et al. (2016) said “a general shared globalised production environment” (p. 440) – as well as “...national particularities in news reporting with which information is made culturally resonant for a specific audience”, an aspect which bases on national journalistic practices (p. 24).

To get a deeper inside in journalistic practices, Lück et al. (2015) has also examined the role of journalists in climate change coverage and assume professional networks between journalists and public relations practitioners from environmental non-governmental organizations (p. 1) “...that either side establishes and maintains” (p. 10). To investigate these coproduction processes, Lück et al. (2015) conducted three comprehensive case studies during the United Nations Climate Change Summits in Cancún 2010, Doha 2012, and Warsaw 2013

using semi-standardized interviews for questioning 36 journalists from nine countries (Germany, the United States, South Africa, Brazil, India, Britain, Mexico, Qatar, Poland), transnational news agencies (AP, Reuters, Bloomberg), and 16 representatives from transnational NGOs (Climate Action Network, Friends of the Earth, Climate Analytics, Global Call for Climate Action, Greenpeace International, One World, Oxfam and WWF International) (p. 11). Altogether, 78 interviews were realised (p. 11).

One finding of Lück et al. (2015) is that most of the interviewed journalists (21 out of 36) are environmental journalists, 15 out of 36 are more general news reporters (p. 13). Moreover, they found out that 19 from the 21 environmental journalists and 6 from the 15 general news journalists cultivate contacts with NGO representatives (Lück et al. 2015, p. 14). Besides, Lück et al. (2015) identified four different kind of coproduction networks between journalists and NGOs:

1. Network: Transnational media and global ENGOS

Four environmental journalists from transnational media and eight communicators of global ENGOS (for example, Climate Action Network International, Friends of the Earth International, or the Worldwide Fund for Nature) are part of this first network (p. 14). All network users from network 1 are able to influence decision-making by directly corresponding with people who are involved and/or highly interested in climate change issues, such as policy-makers or national politicians (p. 14 f). “Within this network journalists and NGO representatives tend to have long-lasting trustful personal relationships” (Lück et al. 2015, p. 15).

The journalists referring to network 1 see themselves as information providers and, therefore, need information from ENGO representative, although they know about their strategic orientation (Lück et al. 2015, p. 15). Lück et al. (2015), moreover, identify similarities in interpretation between the two network users: “In Warsaw, the three transnational journalists named “loss and damage” as well as “finance” as the central aspects. Both topics were also named by the ENGOS as central for them” (p. 16).

2. Network: National media and national ENGO branches

14 journalists from national media and nine people from ENGO member organizations and local, regional or national branches and bureaus are part of network 2 (Lück et al. 2015, p. 17). As a result, mostly national media is served from this network group (Lück et al. 2015, p. 17). The ENGOS in this network provide information for a national audience and help journalists to understand and interpret the climate change conferences as it is relevant for the respective countries (Lück et al. 2015, p. 17).

Lück et al. (2015) found a major difference in comparison with the first network group: “Assessments on the main story of the COP differ among the journalists and NGO representatives in this network as well as between both groups” (p. 19).

3. Network: International news agencies and (global and national) ENGOs

Three political reporters from international news agencies as well as ENGO representatives (global communicators and representatives from regional or national branches) are part of this network group, having the task to provide information about the topic for international news agencies (Lück et al. 2015, p. 20). Therefore, the journalists contact the ENGO representatives, however, they are clearly not their only information source (Lück et al. 2015, p. 20). “ENGO interviewees reported to us that it counts as a great success to place a story with one of the international wire services” (Lück et al. 2015, p. 20). Lück et al. (2015) found out that news agency journalists use ENGOs for getting contrasting positions to political and business actors (p. 21).

4. Network: Business media and global ENGOs

Five reporters from business newspapers are part of this fourth network analysing the consequences of climate change conferences for economies and markets nationally and globally (Lück et al. 2015, p. 21). As the journalists in the first two networks, also these journalists look for the expertise and insider knowledge of ENGO’s (Lück et al. 2015, p. 21).

In addition to these four networks, Lück et al. (2015) found eleven journalists without or with only few connections to get information from ENGOs (p. 21). As a reason for that, these journalists prefer first-hand information from individual sources as they do not like the influential practices of ENGOs (Lück et al. 2015, p. 22). “They certainly keep an eye on NGO activity, e.g. protests and public statements, and sometimes include a paragraph on a demonstration in their writing” (Lück et al. 2015, p. 22).

Lück et al. (2015), furthermore, explain that the climate change conferences support coproduction between journalists and ENGO representatives, because it is not daily business of both actor groups (p. 23). For Lück et al. (2015), their findings about journalistic work shows that there are “...production processes that shape the global image of the climate change conferences in much greater detail” (p. 23) and “...that the journalistic beat is influential as is the type of media outlet for which journalists work” (p. 23). In addition, the authors say that ENGO’s focus “...on setting the media agenda and determining media imagery” (Lück et al. 2015, p. 23) with the support of direct lobbying “...toward expert communication and thus toward specialized journalists and delegations...” (Lück et al. 2015, p. 24).

With these findings, Lück et al. (2015) discuss two issues, which could not be considered by this work and, thus, take the results of this work further in two ways: first, they intensively analyse the practices of journalists, an actor group which was identified as central referring to climate change coverage (see Table 26), in the context of a climate change-related event. And, second, they broaden the literature on lobbying in terms of climate change, a field that is sparsely examined, so far, due to the fact that lobby groups are very secretive about the way they exert influence.

Schäfer and O'Neill (2017) gives an overview and classifies framing approaches as well as literature on climate change. Concentrating on their thoughts on framing climate change coverage, the authors, on the one hand, introduce stakeholder framing, so views from scientists, industry, policymakers, and non-governmental organizations who try to influence the public arena with their framing on climate change. On the other hand, they introduce journalist frames; journalists are the producers of climate change framing (Schäfer and O'Neill 2017, p. 12 ff).

Concerning stakeholder framing, Schäfer and O'Neill (2017) make the point that most existing studies focus on Western countries, an aspect which does not allow comparisons between countries with different economic and societal backgrounds (p. 13). In addition, the authors recognise that political decision-makers and institutions as well as scientists are neglected in the framing literature about climate change, so far (Schäfer and O'Neill 2017, p. 14). This issue is not common in political science (Schäfer and O'Neill 2017, p. 14). Looking at journalist frames, Schäfer and O'Neill (2017) say that – even though journalists are influenced from different normative, organisational and social rules – analyses on journalists' framing of climate change are rare (p. 15).

Besides identifying climate change frames, this work has coded actors of climate change and examined their dominance within the analysed articles; it identifies politicians as important actors of climate change (Hypothesis 2), it looks at the variety of actors (Hypothesis 4b), and at the appearance of all actors (Sub research question 7), but it cannot go into detail about the frames the different actors produced.

Moreover, Schäfer and O'Neill (2017) make clear that most existing studies refer to frame building; analysis that covers "issue framing" are rare (p. 15). However, for Schäfer and O'Neill (2017) "issue framing" puts a new perspective on framing (p. 16) and, thus, might reveal different strengths and weaknesses of framing (p. 17). In addition, Schäfer and O'Neill (2017) make clear that most of the existing framing studies on climate change ignore

visuals or multimodal coverage (p. 20). Just lately, research has started to address these aspects (Schäfer and O'Neill 2017, p. 21).

So, Schäfer and O'Neill (2017) have several requirements in terms of framing research on climate change: they ask for framing more broadcast media and online climate change coverage (p. 22 f) as well as visuals and multimodal coverage (p. 23), to look at countries, other than Western ones (p. 23), to make sure that framing research is comparable (p. 23), and to examine "...how frames come to exist in the world..." (p. 23) and "...how people connect the ways they frame climate change in their minds..." (p. 23). Moreover, the authors require to increase the perspectives concerning framing studies on climate change to other scientific disciplines, such as political sciences (Schäfer and O'Neill 2017, p. 24).

7.2. Australian climate change studies since 2011

In Australia as well, the public's attitude to climate change was of interest for researchers after 2011 (see, for example, Morrison et al. 2013, Jang and Heart 2015).

Similar to Metag et al. (2015), Morrison et al. (2013) also used the approach of the "Global Warming's Six Americas" study by Maibach et al. (2011) to identify people's attitudes to climate change in Australia (p. 3).

Morrison et al. (2013) analysed data derived from 1,927 Australians with a mean age of 47.4 years using an online questionnaire (p. 4). The Australian participants answered the same 36 questions asked by Maibach et al. (2011) as well as questions about preferences for climate change policies, energy-use behaviours, knowledge of climate science, appropriate communication channels, psychographics (personality, value and attitude information) and socio-demographics (Morrison et al. 2013, p. 4).

The Australian results show a small sample of *Alarmed* (10.8 per cent) and *Concerned about global warming* (22.5 per cent), whereas more than 40 per cent are *Disengaged*, *Doubtful* or *Dismissive* of climate change (Morrison et al. 2013, p. 3). Across the entire Australian sample, 44.9 per cent of respondents think that global warming is mainly man-made (Morrison et al. 2013, p. 6). Moreover, the Australian *Alarmed* (34 per cent), *Concerned* (28 per cent) and *Cautious* (25 per cent) groups believe that global warming will harm them personally and all Australian segments state that the impacts of global warming will affect them more quickly (Morrison et al. 2013, p. 6). In addition, Australians place a high priority on companies and citizens when it comes to taking action to tackle climate change (Morrison et al. 2013, p. 13). So, the authors discovered that the public sees itself as well as companies as

responsible for climate change. In the context of this research about Germany and Australia, this finding is striking, because responsibility frames are only rarely mentioned. Another finding is that the *Disengaged* (20 per cent), the *Doubtful* (13 per cent) and the *Dismissive* (10 per cent) say that the Prime Minister and the government are not the responsible for taking action to reduce climate change (Morrison et al. 2013, p. 13). This finding is also remarkable, because this research identifies the dominance of political actors in the climate change discussion in Australia. So, the question arises whether public opinion is sufficiently represented in the print media. As hypothesis 6 of this research shows: sometimes the opposite of the public's demands is represented in the media.

Jang and Hart (2015) analysed frames in social media content from 1 July 2012 to 30 June 2014, using Twitter data from four English-speaking countries (US, UK, Canada, and Australia) (p. 12). The authors decided that any messages had to mention "climate change" or "global warming" and 1. "real" or "fact" for "real frames", 2. "hoax frames" including the terms "hoax" or "lie" or "fraud", 3. "impact frames" including the terms "impact" or "impacts" or "threat" or "threats" or "consequences" or "effects" or "affect" or "affects" or "disaster", 4. "cause frames" including the terms "cause" or "causes" or "fuel" or "carbon" or "CO₂" or "human", and 5. "action frames" including the terms "act" or "action" or "stop" or "fight" or "policy" or "policies" (Jang and Hart 2015, p. 14). On a normal day, the people of the four nations generated 6,085 (US), 1,041 (UK), 639 (Canada), and 641 (Australia) tweets that mentioned either "climate change" or "global warming" (Jang and Hart 2015, p. 14).

The results show that "cause frames" as well as "action frames" are very popular in Australia, a finding which is attributed by the authors to a new carbon law with which the Australian government recently puts a price on greenhouse gas emissions (Jang and Hart 2015, p. 14): "The coupling of cause and action frames may reflect this ongoing political landscape in Australia given that the government action was accompanied by heated debates about the cause of climate change (human activities vs. nature)" (Jang and Hart 2015, p. 14). This finding, that causes and action dominate the Australian climate change discussion is a result that corresponds with the findings of this research in which the frame "Climate effects and action" were found with significant frequency.

Findings show that the terms "climate change" and "global warming" were used equally, higher values indicate that "global warming" was more likely to be associated with "hoax frames" and "cause frames" than "climate change". In Australia, as in all other countries, "climate change" was used more frequently than "global warming" on Twitter, "hoax frames" excluded (Australia: 1.18) (Jang and Hart 2015, p. 15). So, "hoax frames" which refer to "lies" and "fraud" (Jang and Hart 2015, p. 15) in the climate change discussion

mainly look at “global warming” as a “hoax”, i. e. the increase in temperature and its causes, but not on the consequences of “climate change”.

Gurney (2014) compared the level of climate change coverage in three Australian elections: in 2007, when Kevin Rudd became Prime Minister, in 2010, when Julia Gillard was elected and, in 2013, when Tony Abbott took office (p. 3). To do this, she used three initial searches in the *ProQuest ANZ Newstand* database using the search terms “climate change” and “climate change” + “moral” and “climate change” + “carbon tax” (Gurney 2014, p. 3). The search term ‘moral’ was especially used to capture the extent to which Rudd’s ‘greatest moral challenge’ catchphrase was cited in discussions about the topic and to find out whether the coverage discussed the moral or ethical implications of climate change politics (Gurney 2014, p. 3). The time period ranges used were from the formal announcement of the election to polling day (Gurney 2014, p. 3). So, Gurney (2014) did not look at a broader timeframe before and after election day, as it is done in this research, but just concentrated on the immediate period of the election.

Reviewing the purely quantitative count of news stories, Gurney stated that “...there was a dramatic decrease (almost 40%) in the raw number of stories mentioning the phrase ‘climate change’ between the 2007 and 2013 elections” (2014, p. 4). And she found a 50 per cent decrease in articles which included both the words “climate change” and “moral” between 2007 and 2013 (2014, p. 4). The use of the terms “climate change” and “carbon tax” decreased between 2010 and 2013 by approximately 8 per cent (Gurney 2014, p. 4). So, all topics relating to climate change were less discussed in the 2013 election in which Tony Abbott – who stated that climate change is “crap” (Readfearn 2014) – won against Kevin Rudd.

In order to identify the main themes of climate change coverage during the 2013 elections, 1,568 news stories that used the keywords “climate change” between 5 August and 7 September 2013 – the official election period – were downloaded from the *ProQuest ANZ Newstand* database (Gurney 2014, p. 5). In contrast to this research, which was manually coded – the texts were uploaded into the *Leximancer* text analytics and data mining software to map the conceptual relationships (Gurney 2014, p. 6).

With the *Leximancer* analysis, Gurney (2014) showed, both quantitatively and qualitatively, that climate change policy and issues were largely set in the context of carbon tax by all political parties, including the Australian Greens (2014, p. 13). The aspect “carbon tax” was not identified as a frame sub-dimension in this research, because it was introduced after the

election in 2007, i. e. during the years after 2010 by Prime Minister Julia Gillard (see Table 4). Thus, this finding by Gurney (2014) presented a new issue in the Australian climate change discussion.

Abbott's success during the time in which Julia Gillard was in office was based on framing the carbon pricing scheme as a 'tax' and her reaction on this impeachment (Gurney 2014, p. 13). Gurney (2014), moreover, adds that "both, Rudd and Gillard, chose to construct their carbon pricing policy defences within Abbott's "tax" frame, giving it added power and credence" (p. 16). Within this discussion, the media narrowed the frame about climate change to the political drama around political leaders, shifting the public discussion away from the science of climate change (Gurney 2014, p. 16). Gurney (2014) also wrote that "despite increasing evidence that the prophesied impacts of global warming are already being felt, it would seem that both major political parties chose the 'small target' approach to climate change policy for different reasons" (p. 16).

Similar to this research, Gurney (2014) showed how much impact politics has had on the climate change discussion in Australia. The climate change issue is often simplified as a matter of carbon tax and of impeding economic growth; the carbon pricing scheme and the carbon tax could place a burden on the economy and impede economic development. It also shows that news values, in this case the news value "conflict" in relation to the discussion around the carbon tax, is sometimes preferred by the media instead of emphasising the importance of the topic itself.

In comparison to this research, Gurney (2014) found a new issue in the climate change discussion of Australia, that is to say the "carbon tax" but missed other frames/frame sub-dimensions related to the three political elections in Australia. The broader approach taken in this research might have revealed changes in other political discussions about climate change, for example in terms of its economic consequences.

Lidberg (2018) carried out a comparative study on the media coverage around COP 15 and COP 21 (p. 70). To do this, he analysed the content of the print and online editions of *The Sydney Morning Herald*, which is owned by Fairfax Media Limited, as well as *Daily Telegraph*, owned by News Corp, which controls 60 per cent of the Australian newspaper market (Lidberg 2018, p. 74). He was interested in their different approaches to reporting on climate change (Lidberg 2018, p. 72).

For the content analysis, Lidberg (2018) asked two questions: 1. How much coverage of climate change did the COPs generate? And 2. Which voices/sources did the journalists use

in their stories? (p. 72). A total of 247 articles were examined around the COP 15 event and 273 around COP 21 (Lidberg 2008, p. 73).

From 12 to 22 December 2009, the articles around COP 15 were identified using the keywords “Copenhagen” or “climate” or “global warming”, while the media coverage around COP 21 was studied between 25 November and 16 December 2015, using the keywords “Paris” or “climate” or “global warming” (Lidberg 2018, p. 75). In both research periods, Lidberg (2018) used *Factiva* as a primary and *ProQuest* as a secondary database to increase the validity of the sample (p. 75). The content analysis of COP 21 was complemented by semi-structured interviews with five senior Australian reporters in the lead up to and after COP 21 (Lidberg 2018, p. 75).

Lidberg’s (2018) first finding was the fact that the *Daily Telegraph* (n = 79) published less than half of the coverage of COP 15 compared to *The Sydney Morning Herald* (n = 168) during COP 21 (p. 76).

Looking at the types of stories, both newspapers preferred “news”, second was “editorial/opinion”, and third was “features/in-depth”. These results are comparable to the findings of this research in terms of form of expression: if “news” is “informing” and “editorial/opinion”, “features/in-depth” and “others” are classified as “commenting”, there was a slight predominance of informing/news articles in the contest of climate change/climate change policy events.

For Lidberg (2018) the decreasing number of “editorial/opinion” stories was the result of a decline in the influence of climate sceptics and he reminds us that – after COP 21 – Australia was one of the 190 countries that signed up to the goal of keeping further global warming to a maximum of 1.5 degrees (p. 82).

Lidberg (2018) also identified the voices representing the two COPs. These results are also comparable with this research, identifying political systems – national as well as international – as the most dominant actors (COP 15: 64 per cent; COP 21: 54 per cent) followed by “science/expert” during the COP 15 (20 per cent) and civil society during COP 21 (22 per cent) (Lidberg 2018, p. 78).

The semi-structured interviews with five senior Australian reporters took place before COP 21 (October and November 2015) and during January and February 2016 (Lidberg 2018, p. 79). In this context, three findings were highlighted by Lidberg (2018): 1. The climate-change-sceptic lobby refused to be interviewed, 2. There was a consensus that the new

and growing alliance between environmental groups, NGOs and business and venture capitalists is a potent force for rapid change and action on climate change, and 3. That the diversity of sources – national as well as international – became more important for journalists (p. 82).

Although Lidberg (2018) did not analyse the framing of the two COPs and the results of the interviews are based on a small sample size, the findings from the interviews are nevertheless relevant for the context of this research. Comparing the political event of the COPs with the 2007 election, the climate-change-sceptical position remained at a relatively low level and there was no difference between before and after the election (see Hypothesis 10). Whether the identified decline of the sceptical position results from the new and growing alliance between environmental groups, NGOs as well as business and venture capitalists after COP 15 or from a general decline in climate change coverage due to a change of political leaders (see, for example, Gurney 2014) still needs to be verified. That there are a broad range of sources in Australian climate change coverage was also identified in this research (Hypothesis 4b). There seems to be a constant demand for broad perspectives in the climate change coverage in Australia.

Shea et al. (2020) want to know about the presence of climate change articles about Pacific Islands in English speaking countries, and, therefore, asked two research questions:

1. How does the volume and strength of focus of coverage of Pacific Islands and climate change vary over time and between newspapers?
2. Which different narratives in reporting on Pacific Islands and climate change are present? (p. 3)

To answer these questions, Shea et al. (2020) analyses volume, content, and dominant narratives in the American (The New York Times, 12.4 per cent, The Washington Post, 7.2 per cent) the British (The Guardian, 26.0 per cent, The Times/The Sunday Times, 7.1 per cent), and the Australian (The Sydney Morning Herald/The Sun Herald, 25.2 per cent, The Australian, 22.1 per cent) press from January 1999 to December 2018 (p. 5). The articles (n = 709: United Kingdom (n = 234), the United States of America (n = 139), Australia (n = 336)) were found with using Factiva and were examined using a code book, developed inductively (Shea et al. 2020, p. 4 f). In addition, Shea et al. (2020) did semi-structured interviews with international journalists (n = 9), Pacific journalists (n = 5) as well as Pacific stakeholders (n = 9), so people who create stories about and are interested in a certain representation of Pacific Islands in the context of climate change (p. 5).

The strength of focus on Pacific Islands and climate change – so whether it is “brief mentioned”, a “minor focus article” or a “main focus article” (Shea et al. 2020, p. 5) – was coded to answer research question 1. For research question 2, the dominant narrative was coded, so whether there is “no impact”, “vulnerability”, “solutions/responses”, and “contribution” (Shea et al. 2020, p. 5 f).

Shea et al. (2020) found out that from 1999 to 2018 only 0.0084 per cent of all articles represent Pacific Islands in the context of climate change with “...a large jump in the number of articles published on Pacific Islands and climate change in 2015...” (Shea et al. 2020, p. 7). Looking at the narratives, Australian newspapers, as being of interest in the context of this work, having about 60 per cent of the “vulnerability narrative” in all articles (Shea et al. 2020, p. 9 f). “Since 2015, the proportion of vulnerability narratives has significantly decreased in favor of solution/response narratives...” (Shea et al. 2020, p. 10). In addition, Australia – more specifically the newspaper *The Australian* – has 12.1 per cent “no impact” article, an outstanding result in comparison to the other newspapers examined (Shea et al. 2020, p. 10).

Shea et al. (2020) conclude that over the examined decade, Pacific Islands and climate change are only rarely a topic in the analysed newspapers with an increase in coverage since 2015 (p. 13). The vulnerability narrative is most dominant in the analysed newspapers and refers to climate impacts, a focus that is approved by both, journalists and Pacific stakeholders, in the interviews (Shea et al. 2020, p. 13). For Shea et al. (2020), there is, however, “...a conflict between the power of drowning island language as a journalistic tool for highlighting climate impacts and the implications of those representations” (p. 14).

With this research, Shea et al. (2020) show that Australian journalists and stakeholders refer only little to the issue of sinking or drowning Pacific islands in the context of climate change coverage. As some Australian newspaper, such as *The Australian*, even say that climate change has no consequences for Pacific islands, it seems that international climate change issues are not of interest for some Australian newspaper owners – in this case News Corp. As discussed in Chapter 3.3, Josephi (2011) says that when it comes to climate change, the decision about whether a story is published, or not, is made by media outlets with national news values in mind (p. 20). For Australia, national news issues are of high interest as this research also shows (Hypothesis 6).

8. Discussion

This chapter discusses the results of this research related to the hypotheses and sub research questions. It examines the differences and similarities in terms of climate change and offers some conclusions. In addition, it explains how these results might influence further research. At the end of this chapter, the development in climate change research described in Chapter 7: Climate change research since 2011 is considered in relation to the hypotheses.

8.1. Discussion: comparing the coverage in Germany and Australia

The comparison between coverage in Germany and Australia identifies whether there are differences or similarities in the representation of climate change coverage in terms of frames/frame sub dimensions, actors and writing style.

Looking at the results of the frames, in Germany, the coverage creates a general picture of climate change; the frame “Disconnected problem definition” is predominant. In Australia, climate change coverage is more concrete, focusing on “Climate effects and action” (Hypothesis 1). In terms of “Sceptical views”, i. e. the representation of voices that are sceptical of climate change, the coverage in the two countries is similar (Hypothesis 3).

The variety of perspectives on climate change was – contrary to the assumption defined in hypothesis 4a – broader in Australia than in Germany. Australian climate change coverage includes more perspectives on climate change in a single article than Germany.

In addition, the German media refers to international climate change action. When analysing the frame element “Treatment recommendation”, international climate change action is significantly predominant in the coverage, whereas the media in Australia concentrates on national action related to climate change (Hypothesis 6). Looking at the four indices of the effects of climate change – 1. Effects on nature, 2. Effects on the weather, 3. Effects on humans, and 4. Effects on the economy –, there was only a significant difference for “Effects on the weather”. Summarising all four effects indices to a new index “Effects of climate change, in general”, a small but significant difference was identified (Hypothesis 7).

Based on these findings, the following conclusions can be drawn.

Hypothesis 1 is confirmed and this leads to the assumption that the journalists writing for German newspapers suppose that no differentiated coverage is necessary in a country in which the climate change issue is – as Tilly (2007) wrote – securely established in the public

discourse (p. 361). Based on the results related to Hypothesis 4a, which predicted that the perspectives on climate change per article would be significantly lower in Germany than in Australia, the question arises whether this kind of climate change coverage creates space for more climate-change-critical or climate-change-sceptical positions in Germany, in future. This is supported by the fact that there are (at least) 5,000 lobbyists in Berlin (see Bülow 2010) who represent their economic interests in the Deutsche Bundestag [German parliament] and, thus, can also indirectly influence media reporting of climate change. So, it would be of interest for further research to identify whether there was a return of differentiated climate change coverage after the end of the period in which this research was carried out or whether an increase in the influence of economic interests and conservative think tanks can be identified.

Two of the studies described in Chapter 7: Climate change research since 2011 support the former: Lörcher and Taddicken (2017) wrote that “there is a greater diversity of topics in the mass-media-induced discussion arena” (p. 14), including “causes” (68 per cent), “consequences” (61 per cent), and “mitigation/adaptation measures” (71 per cent) (p. 11). Wessler et al. (2016) identified frames which refer to climate change effects, consequences and action in the German media (pp. 436 ff.). So, there seems to be a return of a climate change discourse.

In Australia climate change coverage mainly discusses “Climate effects and action” (Hypothesis 1) and introduces a significantly broader variety of perspectives on climate change than it is the case in Germany (Hypothesis 4a). The question is now whether this type of climate change coverage was a temporary phenomenon based on the research period that was chosen. Finally, climate change was on the political agenda in Australia during the research period. But – as McDonald (2012) wrote – “of all states in global politics, there are few that could lay claim to being as inconsistent on global climate change as Australia” (p. 579). Thus, attitudes to climate change as expressed in Australian newspapers have already changed due to the different climate change mindset of the current Australian government. For Jang and Hart (2015) (see Chapter 7: Climate change research since 2011) this is, however, not the case. In their study, they confirm the findings in this research some years after the period in which it was carried out, writing that “cause frames” as well as “action frames” are very popular in Australia because the media likes to encourage government action by initiating debates about the causes of climate change (human activities vs. nature) (p. 14). So, further research might support the preference of Australian media for cause and action frames in terms of climate change.

The effects of climate change – 1. Effects on nature, 2. Effects on the weather, 3. Effects on humans, and 4. Effects on the economy – are analysed in detail in this research (Hypothesis 7). There only appears to be one significant difference for “Effects on the weather”, which had a higher mean frequency in Australia. This result reflects the climate situation in Australia: Australia’s climate has warmed by 0.9 °C since 1910, and the frequency of extreme weather has increased, with more extreme heatwaves, fewer cool extremes and a decline in rainfall, especially in the southwest, dominated by reduced winter rainfall (see, for example, Australian Bureau of Meteorology and CSIRO 2014, p. 3). In addition, the the four indices are summarised in one index “Effects of climate change” to get a general overview on climate change effects in the climate change coverage of the two countries. This general index shows a small but significant difference with Australia having more climate change effects in their coverage. Therefore, hypothesis 7 shows that, in Australia, the media would be more likely to frequently represent the effects of climate change.

Concerning sceptic voices, it is a surprise that hypothesis 3 – “In Australia, the representation of sceptical viewpoints is a normal aspect of climate change coverage. German newspapers consider sceptical voices only rarely.” – is not confirmed. Remembering the literature used to identify this hypothesis: McGaurr et al. (2013) wrote that the “uncertainty” frame is predominant in Australia’s news media (p. 27), while Arlt and Wolling (2012) reported that the “uncertainty discourse” is rarely mentioned in Germany (p. 291). So, is German climate change coverage already “scepticised”?

This question makes sense in so far as the results of this research refer to events – an election and an environmental disaster – which do not only focus on climate change. The agenda of an election programme includes several topics, so an environmental disaster is not only connected with climate change, but also with issues such as human fortunes and insurance aspects. Contrary to this, Arlt and Wolling (2012) examined the reporting during the Copenhagen Climate Change Conference and McGaurr et al. (2013) analysed the media reporting of the IPCC’s first two reports in 2007. Thus, one conclusion of the fact that hypothesis 3 was not substantiated is that climate change coverage without clear references to a climate-change-related policy event creates space for critical opinions about the existence of climate change in both countries.

It is of course reasonable that, due to the availability of a broader data set, events such as the climate change conferences should be used for climate change research. In Chapter 7: Climate change research since 2011, Lörcher and Taddicken (2017) confirm that the mass media arena mainly refers to the “IPCC report” itself (49 per cent), followed by “Climate Policy” (39 per cent) (p. 10). So, most climate change coverage focused on climate-change-

related policy events. Nevertheless, it is of further interest to know the agenda of print and other media in terms of climate-change-sceptical positions outside events such as these.

As Chapter 7: Climate change research since 2011 shows that a number of studies about climate scepticism were published since the period in which this research was carried out (see, for example, Lörcher and Taddicken 2017, Brüggemann and Engesser 2017, Kaiser and Rhomberg 2016). Lörcher and Taddicken (2017) discovered that 88 per cent of the mass media claim “climate change exists” and deduce from this fact that the 12 per cent who doubt the existence of climate change are climate-change-sceptical voices (p. 11). Brüggemann and Engesser (2017) identified 4 per cent of contrarian voices in German newspapers (p. 63). In addition, the authors discovered that the contrarian voices challenge “Anthropogenity” as well as “Risks” in 4 per cent of all articles, “Emission reduction” in 2 per cent and “Global warming” in 1 per cent of all articles (n = 201 articles) (Brüggemann and Engesser 2017, p. 63). Kaiser and Rhomberg (2016) reported that 52 out of 379 articles included 122 sceptical statements, which is 15 per cent of all articles (p. 563). The authors also studied *Frankfurter Allgemeine Zeitung* and *Süddeutsche Zeitung* and stated that *Frankfurter Allgemeine Zeitung* used positive connotations when referring to climate-change-sceptical ideas, while *Süddeutsche Zeitung* was more balanced (Kaiser and Rhomberg 2016, p. 566). Moreover, the authors introduced an interesting thought, stating that climate change scepticism is a transnational Western phenomenon embedded in the national context (Kaiser and Rhomberg 2016, p. 568). This statement would support the results of this research which did not identify any difference in terms of climate change scepticism.

In addition, the climate change discussion is highly dependent on the national government’s opinion in Australia. So, the picture might be different when comparing the political elections in 2013, when Tony Abbott became Prime Minister in Australia, saying that anthropogenic climate change was “crap” (Readfearn 2014) with the time when the CDU/CSU took office with the SPD in Germany. This assumption, too, should be examined in further research.

Gurney’s (2014) study of climate change’ during the 2007 and 2013 Australian elections, presented in Chapter 7: Climate change research since 2011, supports this assumption. She identified “...a dramatic decrease (almost 40%) in the raw number of stories mentioning the phrase ‘climate change’ between the 2007 and 2013 elections” (Gurney 2014, p. 4). And she found a 50 per cent decrease in articles which included both the terms “climate change” and “moral” between 2007 and 2013 (2014, p. 4). Use of the terms “climate change” and “carbon tax” decreased between 2010 and 2013 by approximately 8 per cent (Gurney 2014, p. 4). So,

all topics relating to climate change were discussed less in the 2013 election in which Tony Abbott won against Kevin Rudd.

Hypothesis 6 was developed from the literature about the public's attitude to climate change. It was expected that the media in both countries make national politicians responsible for tackling climate change. The results, however, show that German climate change coverage expects international politicians to tackle climate change. In Australia, the media – as assumed in Hypothesis 6 – says national politicians are responsible. One reason for the opposite result in Germany might be that the agenda of the climate change coverage in both countries is independent of public opinion. Further research could identify whether this phenomenon of not considering public opinion can also be identified in a different contexts and/or in different media, in Germany.

Discussing results in terms of actors involved in climate change coverage, Australia's politicians are significantly more influential as senders of climate change coverage than those in Germany (see Hypothesis 2). Moreover, the variety of actors is higher in Australian than in German media (Hypothesis 4b). So, in Australia, there are more articles which include more than one actor, for example a scientist and a politician who contribute to the same article. This finding was also confirmed by Lidberg (2018) in his study about COP 15 and COP 21 (see Chapter 7: Climate change research since 2011).

These findings lead to the following conclusions.

Australia's politicians have a major influence on the country's climate change coverage. For example, Gurney (2014) (see Chapter 7: Climate change research since 2011) explained the influence of Australian politicians in terms of media coverage, revealing that, between the Australian elections in 2007 and 2013, the media narrowed the climate change frame to the political drama around the various political leaders, shifting the public's attitude away from the science of climate change (p. 16). This fact also supports the assumption in hypothesis 3 that there might be a different picture in terms of sceptical voices in a different research period. However, the results of Hypothesis 4b show that, in Australia, politicians are often not the only senders of climate change issues, but a variety of actors. The question is, now, whether the additional senders support the opinion of the political actors or whether they present a different viewpoint on climate change. Remembering Boykoff and Boykoff's (2004) statement about balance-as-bias news reporting (p. 350), which is a journalistic practice in Australia, opposing opinions may be presented in a single article. This, on the one hand, means that a sceptical politician may be confronted with a scientist who presents scientific results that climate change exists in the same article. On the other hand, this also

means that a politician who believes that climate change is happening is cited in the same article alongside a business person with a sceptical viewpoint. So, it might be of interest to know how the readers or spectators of climate change information in the media assess the importance of the different climate change senders: is the politician seen as more reliable or the scientist? Is a member of civil society or the journalist who wrote an article based on his/her own knowledge seen as a climate change expert? It would be interesting to research the prevalence of opinions held by different senders involved in climate change coverage.

Concerning the writing style of articles written by journalists, no differences were identified. German and Australian climate change coverage includes an equal number of informing and commenting articles (Hypothesis 5).

The following conclusions are drawn from this finding.

Bear in mind that the self-concept of German journalists includes being an informer and criticiser, whereas the self-concept of Australian journalists involves being a watchdog and an analyst (see Chapter 3.4.3.). The assumption that these self-concepts result in German journalists using an informing writing style and Australian journalists using a commenting one is, however, not confirmed (Hypothesis 5). Defining an informing writing style as more credible and, thus, as the preferred writing style for conveying climate change issues, the result of hypothesis 5 is good news. German as well as Australian journalists write their climate change coverage with necessary diligence – the percentage using the informing writing style is higher in both countries (Germany: 52.1 per cent; Australia: 55.4 per cent) –, nevertheless, climate change is also represented as an emotional and individual topic (commenting writing style in Germany: 47.9 per cent; in Australia: 44.6 per cent). Thus, the statement by Lünenborg and Berghofer (2010) that the Australian self-concept “watchdog” seems to reflect a much more investigative approach to journalism with a focus of the political and economic elites of the country (p. 37) as well as Rodrigues’ (2008) finding that illegal practices are occasionally used in Australia to strengthen their role (p. 117) is not verified. It might, nevertheless, be of interest to analyse whether there is more sensational or captious news coverage in Australia due to a greater aspiration to play the role of a watchdog, with a larger data set of articles only having journalists as actors involved in climate change coverage.

For Germany, the result based on hypothesis 5 means that the self-assessment of journalists represented in the results of Weischenberg et al. (2006) (76.4 per cent of German journalists say they “inform the public neutrally and precisely” (p. 356)) and Lünenborg and Berghofer (2010) (82.7 per cent say they “inform the public neutrally and precisely” (p. 38)) can also

not be verified. If this self-assessment reflected reality, Germany would have had significantly more articles with an informing writing style. But this is not the case. Thus, further study could explore what the words “neutrally” and “precisely” mean for German journalists in the context of writing about climate change. In addition, a further look at the socialisation and self-concept of the editors-in-chief and the media owners who edit and approve Germany’s media coverage, respectively, might be of interest for further research.

Table 49 provides an overview of all hypotheses and sub research questions that were used to compare German and Australian climate change coverage.

Table 49: Overview of all hypotheses/sub research questions comparing Germany and Australia

Hypothesis	Cluster/Index	Germany (percentage or mean)	Australia (percentage or mean)
Hypothesis 1	“Disconnected problem definition”	higher	lower
Hypothesis 1	“Climate effects and action”	lower	higher
Hypothesis 2	“Politicians”	lower	higher
Hypothesis 3	“Sceptics”/“Non-sceptics”	nsd	nsd
Hypothesis 4a	Variety of climate change coverage	lower	higher
Hypothesis 4b	Variety of actors involved in climate change coverage	lower	higher
Hypothesis 5	“Commenting”/“Informing”	nsd	nsd
Hypothesis 6	“Treatment recommendation – national versus international”	higher international focus	lower international focus
Hypothesis 6	“Treatment recommendation – national versus international”	lower national focus	higher national focus
Hypothesis 7	“Effects on nature”	nsd	nsd
Hypothesis 7	“Effects on the weather”	lower	higher
Hypothesis 7	“Effects on humans”	nsd	nsd
Hypothesis 7	“Effects on the economy”	nsd	nsd
Hypothesis 7	“Effects on climate change, in general”	lower	higher

nsd: No significant differences between the two countries.

8.2. Discussion: comparing the coverage of the two climate-related events

This second part of Chapter 8 discusses comparisons between the climate change coverage of the two events.

Looking at the frames first, the environmental disaster and the election were both analysed in terms of their predominance among coverage of national and international activities. This is why, on the one hand, the time *after the environmental disaster* – the flood – happened is analysed. Because it was a national event, the assumption was that the newspaper coverage might discuss this environmental disaster in a national context. On the other hand, the period *before the election* was examined, i. e. the time during the election period, in which the issue of climate change might be used for election campaigning demanding for international climate change activities. These assumptions were right with a significant difference: the climate change coverage during the election mainly demanded international action, while coverage of the environmental disaster emphasised national action (Sub research question 1).

Testing whether the same time periods are dominated by the five indices of effects introduced in hypothesis 7 – i. e. 1. Effects on nature, 2. Effects on the weather, 3. Effects on humans, and 4. Effects on the economy, and 5. the summarised index “Effects of climate change, in general” –, the results show no differences (Sub research question 2).

The hypothesis that the newspaper coverage around the election would demand action and that the media would refer to the consequences of climate change during the time of the environmental disaster is not substantiated (Hypothesis 8). The clusters “Treatment recommendation national”, “Treatment recommendation international” and “Focus on treatment information”, representing the election in a new cluster “Climate action coverage”, and the clusters “Focus on consequences excluding effects on the economy” and “Economic consequences”, representing the time after the environmental disaster in a new cluster “Climate consequences coverage”, show no significant difference.

Based on these findings, the following conclusions can be drawn.

The results related to sub research question 1 confirm the assumption that coverage during the time after the environmental disaster mainly demanded national action, while, in the period before the election, it emphasised international action. This result confirms general expectations because there were issues such as crafting an international climate protection agreement on the political agenda, whereas the activities which result from an environmental

disaster, such as providing financial means, are tasks of the national government. Nonetheless, there is an unanswered question, especially in the context of an environmental disaster: besides climate change, which frames are connected with such events?

This question arises when looking at all other hypothesis and sub research questions comparing the election and the environmental disaster in this part of the chapter, because there are no more differences. This result was unexpected.

Accordingly, the question “why is the environmental disaster – in comparison to the election – not stronger connected with the effects and consequences of climate change?” arises. An answer for this question may result from the discussion of hypothesis 3 in the previous chapter: an environmental disaster is not only connected with climate change, but also with issues such as human fortunes or insurance aspects. In addition, news values, which are identified as quite similar in the two countries (see Chapter 3.6), might play a role in this discussion, guiding news in a different direction. Thus, it is of interest to get a full perspective on the framing of an environmental disaster and the role climate change plays in it.

In terms of actors involved in climate change coverage, politicians play a major role in climate change coverage – especially in Australia. Sub research question 4 asks whether political actors are predominant during political elections, whereas other actors are predominant during environmental disasters. However, the difference between the way politicians relate to the two events is not significant.

This finding leads to the conclusion that, during both events, a number of different actors discussed climate change in the media. As a consequence, it might be difficult to include climate change in political agendas during election campaigns and it could be difficult to be seen promoting political activities designed to solve the issues that arise after an environmental disaster. Thus, it might be of interest whether this is especially the case in Australia, where balance-as-bias news reporting is a common journalistic practice, while the variety of actors per article is significantly greater compared to those in Germany (see discussion in Chapter 8.1/Hypothesis 4b). For Germany, these results lead to the question whether all actors involved in the climate change discussion during the two events present platitudes, as summarised in the frame “Disconnected problem definition” (see the results in Chapter 8.1/Hypothesis 1).

Referring to the writing style, the assumption was that 1. politicians increase their public relations activities during the election period through commenting articles in the media, and 2. an environmental disaster encourages journalists to inform the public about climate

change issues. Again, the election period as well as the period after the environmental disaster was examined, however, without finding any significant differences. So, the journalists do not just draw on public relations pieces from politicians as well as do not writing more narrative stories during the election period. They, however, also do not significantly increase writing about facts and data, for example, quantity of flooded houses, during an environmental disaster.

The following conclusions are drawn from this finding.

As already identified (see Chapter 8.1/Hypothesis 5), German as well as Australian journalists write their climate change coverage with necessary diligence including facts and data (informing articles). This does not change when comparing the two events. So, although the self-concepts are different – “informer and criticiser” (German journalists) versus “watchdog and analyst” (Australian journalists) – there seems to be the same demand in terms climate change coverage. This finding might mean that the socialisation and the self-concept of German and Australian journalists is comparable. This finding, however, needs to be verified by further analysis.

Summarising the findings of all hypotheses and sub research questions that compare coverage of the election and the environmental disaster, only one significant difference could be found out: the election period refers to international action in terms of climate change whereas the environmental disaster mention national climate change action.

8.3. Discussion: comparing the coverage before/after the events

This third part of Chapter 8 discusses the results when comparing the climate change coverage during the period before and after the election and the environmental disaster.

Discussing the frames in terms of climate change coverage before and after the election in Australia, the cluster “Climate effects and action” from hypothesis 1, which summarises all relevant five frames of the cluster analysis, is used and compared with the two frames “Disconnected problem definition” and “Sceptics”, which are summarised in a new cluster called “General climate change coverage”. The assumption was that the percentage of the cluster “Climate effects and action” would be higher before the political election, and significantly different to the percentage appearing after the election day. The difference was, however, not significant (Hypothesis 9). Testing this assumption for Germany, the result is the same: there was no significant difference (Sub research question 5). In addition, the sceptical voices accompanying the Australian election were examined. The two clusters from hypothesis 3

are taken – “Sceptical views” and “Non-sceptical views” – testing whether critical and sceptical voices were represented less after election day. However, also here, no significant differences were found (Hypothesis 10).

Looking at the environmental disaster as an event, the assumption was that Australian climate change coverage would concentrate on “Effects of climate change, in general” whereas the German climate change coverage would focus on the negative effects of climate change. Testing this hypothesis with the indices “Effects of climate change – negative”, “Effects of climate change – positive”, and “Effects on climate change, in general”, introduced in hypothesis 7, there were no significant differences in each of the three indices in the two countries before and after the environmental disaster (Hypotheses 11a and 11b).

Based on these findings, the following conclusions can be drawn.

The assumption was that, in Australia, the percentage of the cluster “Climate effects and action” would be higher before the election, and significantly different to the percentage appearing after election day (Hypothesis 9). The difference was, however, not significant. This result makes sense in terms of the theoretical discussion about the 2007 election in Australia: Kevin Rudd made climate change the defining issue in his political campaign after 14 years without a vote on this issue (see, for example, Gascoigne 2008, Bongiorno 2008). And, after Rudd won the election, “the first action of the new Rudd Labor Government was to ratify the Kyoto Protocol – the first time that the first act of an Australian Government was to ratify a treaty” (Suter 2010, p. 268) and he was “...among the most active heads of state at the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties in Copenhagen in 2009, at which Australia had one of the largest delegations” (McDonald 2012, p. 579). So, during the research period – six months before and six months after Australia’s 2007 election – there was a lot of talk and action related to climate change. The result might be different if one examined a longer period after election day in 2007, because, even though he referred to climate change as the “greatest moral challenge”, he then failed to push it through, just walking away from the issue (Suter 2010, p. 310). That climate change is less a topic in the media after Kevin Rudd took office, in 2007, was also a finding of Gurney (2014): she found a 50 per cent decrease in the climate change articles, she analysed (p. 4).

Testing this assumption for Germany, there was also no significant difference (Sub research question 5). One reason for this might be that the new government did not do anything new in terms of climate change, but just extended the work of the former government (Koalitionsvertrag 2005). In addition, the election in 2009 was influenced by the financial crisis.

So, climate change was not the central, but just one of many issues in the political debate (Kuckartz 2011, pp. 130 f.). As climate change is securely established in the public discourse in Germany (see discussion concerning Hypothesis 1), it is not expected to be a central issue in future election campaigns in Germany. So, it is to be expected that the results of election campaigns in Germany are and will be similar when comparing the period before and after the election day in terms of “Climate effects and action”.

In addition, there was no significant difference in terms of sceptical voices before and after the election day (Hypothesis 10). This result – as discussed in Chapter 8.1 (Hypothesis 3) – might change when analysing a longer period after the election day as well as when studying a different election, such as the one in 2013 (see Gurney 2014, Chapter 7: Climate change research since 2011).

Looking at the environmental disaster as an event, the hypothesis that Australian climate change coverage would concentrate on “Effects of climate change, in general” after the environmental disaster – the Queensland flood – whereas the German climate change coverage would focus on the negative effects of climate change after the Oder flood is not substantiated (Hypotheses 11a and 11b). These environmental disasters did not seem to influence reporting on climate change effects. This result further supports the assumption that the issue of climate change is not central when reporting about an environmental disaster (see Hypothesis 3, Sub research question 2 and Hypothesis 8).

So, comparing the time period before and after the election and the environmental disaster, no differences could be identified.

Finally, this chapter examines the newspapers separately. The seven frames are the basis for testing the representation of climate change. The climate change coverage in the four newspapers show highly significant differences. Each newspaper has a different focus on climate change: *Frankfurter Allgemeine Zeitung* prefers “Disconnected problem definition” as well as “Sceptical Views”. *Süddeutsche Zeitung* demands “Focus on treatment information” and “Treatment recommendation international”. *The Sydney Morning Herald* mainly includes “Focus on consequences, excluding effects on the economy” as well as “Treatment recommendation national”. *The Age* refers to “Economic consequences” and “Disconnected problem definition” (Sub research question 6).

This result is contrary to the idea that there is a common way of reporting on climate change in Western media (see, for example, Wessler et al. 2016). With its focus on “Disconnected problem definition” as well as “Sceptical Views”, *Frankfurter Allgemeine Zeitung*’s climate change coverage is the most general. It just refers to the issue climate change saying that it

exists or not exists, but does not explain causes and consequences and does not ask for climate action. *Süddeutsche Zeitung* is very action-oriented. With concentrating on “Focus on treatment information” and “Treatment recommendation international”, it reveals missing information about climate change issues. Moreover, it asks for international action to tackle climate change. *The Sydney Morning Herald* offers information about causes and consequences of climate change (frame “Focus on consequences, excluding effects on the economy”) as well as asks for national action to combat climate change (frame “Treatment recommendation national”). Contrarily to *The Sydney Morning Herald*, *The Age* acts as a spokesperson for the economy (frame “Economic consequences”) and gives general information about climate change (frame “Disconnected problem definition”). That the results of this work are different to those of Wessler et al. (2016) might be based on the fact that Wessler et al. (2016) base this conclusion on a study of climate change conferences, i. e. events where journalists are at the same location and get the same information and impressions. Because the four examined newspapers’ focus on climate change is very different, there must be another power of influence which, however, cannot be identified by this work. This assumption, therefore, needs to be tested by further studies.

A different picture appears when comparing the four newspapers in terms of actors. Only in the *Frankfurter Allgemeine Zeitung* was a significant difference when it comes to citing “international actors”, voices of politicians outside Germany, in comparison to *Süddeutsche Zeitung*. All other actors appear equally often, comparing *Frankfurter Allgemeine Zeitung* with *Süddeutsche Zeitung* and *The Sydney Morning Herald* with *The Age* (Sub research question 7).

Summarising the findings about the four newspapers, each newspaper has a significantly different focus on climate change when framing climate change. However, there is only one difference in terms of actors: *Frankfurter Allgemeine Zeitung* included significantly more international actors than the other newspapers.

8.4. Matching the results and the theoretical framework

As a theoretical framework, Bräuer and Wolling’s “Extended Sphere Model” (2014) was used. Based on the findings from the literature relating to all six spheres, 13 hypotheses and eight sub research questions were defined. This section reviews each of the six spheres as well as the results of their corresponding hypotheses and sub research questions to identify whether some of the spheres include more differences or consistencies than others.

The *Subject sphere* includes individual key issues for a journalist, such as political attitudes, topic selection and topic design (news bias, instrumental actualisation). The “Comparison of German and Australian journalism work attitude” is associated with this sphere as represented by interpretations of the two events (Hypothesis 9 and 11, Sub research question 5). However, no causes and effects or action frames were predominant in the climate change coverage during the two elections or the environmental disasters in Germany and Australia. There were no differences for all hypotheses. So, the way in which journalists interpret and, thus, represent climate change in the four selected newspapers was comparable.

The *Institutional sphere* deals with influences from inside media conglomerates, such as organisational structure, ownership and editorial goals. Hypothesis 4a and Hypothesis 4b represent this sphere. They identify differences in terms of the variety of perspectives on climate change and of actors representing this issue: in both cases, Australia had a broader variety than Germany. So, presenting different perspectives on climate change is more common in Australian newsrooms.

The *Professional sphere* consists of journalistic routines, such as differences in prioritisation of news values and quality indicators. The “Comparison of journalists’ self-concept” is part of this sphere. This sphere consists of hypothesis 5 and sub research question 3, testing whether German journalists use an informing writing style in climate change coverage and Australian journalists a commenting one, comparing the two countries, as well as the context of the election in the each country. In this sphere, too, no differences were found. So, the professional sphere and, thus, the routines were found to be alike in the two countries.

The *Societal sphere* refers to cultural values as well as the institutional parameters of the political media system. So, the role of “The influence of lobbies on climate change politics” and “Comparison of the newspapers” is an issue in this sphere (Hypotheses 3 and 11, Sub research questions 6 and 7). The influence of lobbies is identified through the appearance of sceptical viewpoints in climate change coverage. However, no differences were found, either when comparing the two countries, or the period of the elections. The influence of lobby groups might be similarly in the two countries. Comparing the four newspapers in terms of frames, there are, however, highly significant differences: each of the four newspapers looks at climate change coverage with a different focus. In addition, in Frankfurter Allgemeine Zeitung was a difference in terms of international actors detected. All other actors appear to a similar extent.

The *Public sphere* identifies public opinion as well as strategic communication activities (public relations). It deals with the public’s attitude to climate change (Hypotheses 6 and 7,

Sub research questions 1 and 2). The results show that there was a difference in terms politicians who should tackle climate change: Australia prefers national and Germany prefers international politicians to do so. Moreover, a small but significant difference was found in terms of coverage that included the effects of climate change. Besides, the climate change coverage before the election demanded almost as much national as international action, while the coverage after the environmental disaster focused on national action. No significant difference was found when looking effects of climate change after the environmental disaster and before the political election.

The *Sphere of structural parameters* is most important for this research when looking at current events which might influence climate change coverage, such as in this case of an election and an environmental disaster (Hypotheses 1, 2 and 9, Sub research question 4). So, “Political influence on the German and Australian climate change discussion” as well as “Energy supply, resources, and climate in Germany and Australia” are part of this sphere. There were differences in terms of framing climate change (“general” versus “effects and action”) and in relation to the appearance of political actors in the two countries. No differences in framing climate change or actors, however, were found when comparing the two events. The sphere of structural parameters, consequently, shows that frames/frame sub-dimensions and actors are differently represented in the climate change coverage in the two countries. Comparing the events does not lead to any differences in relation to frames/frame sub-dimensions and actors.

Table 50 provides an overview of Bräuer and Wolling’s (2014) six spheres, the corresponding hypotheses as well as sub research questions and whether a difference or no differences are found.

Table 50: Overview of Bräuer and Wolling’s (2014) six spheres and the corresponding hypotheses/sub research questions

Subject sphere		
Comparison of German and Australian journalism		
Hypothesis	Differences	No differences
Hypothesis 9: Australia’s climate change coverage before the election was strongly dominated by frames of causes and effects as well as of action. After the election, the frames are more diverse.		X
Sub research question 5: Which of the two defined frames from Hypothesis 9 are predominant before and after the German election?		X

Subject sphere**Comparison of German and Australian journalism**

Hypothesis	Differences	No differences
Hypothesis 11a: After the Queensland floods, the Australian newspaper coverage of climate change concentrates on the frame element "Causal interpretation (effects of climate change)", in general.		X
Hypothesis 11b: After the Oder floods, the German newspaper coverage of climate change concentrates on negative effects regarding the frame element "Causal interpretation (effects of climate change)".		X

Institutional sphere**Comparison of German and Australian newsrooms in terms of internal factors of influence**

Hypothesis	Differences	No differences
Hypothesis 4a: German newspapers represent a wide variety of perspectives on climate change. The diversity of frame sub-dimensions is high. In Australia, the variety of perspectives on climate change is low.	X	
Hypothesis 4b: The variety of actors in German newspapers is higher than the variety of actors in Australian newspapers.	X	

Professional sphere**Comparison of journalists' self-concept****Comparison of news values**

Hypothesis	Differences	No differences
Hypothesis 5: German journalists use an informing writing style, while Australian journalists use a commenting one.		X
Sub research question 3: Is the newspaper coverage of climate change around the election commenting and is it informing during the time of the environmental disaster?		X

Societal sphere**The influence of lobbies on climate change politics****Comparison of the newspapers**

Hypothesis	Differences	No differences
Hypothesis 3: In Australia, the representation of sceptical viewpoints is a normal aspect of climate change coverage. German newspapers rarely give space to such sceptical voices.		X

Hypothesis 10: Critical and sceptical voices accompanied the 2007 Australian election (before election day). After the election, the prominence of critical and sceptical voices was clearly reduced.	X
Sub research question 6: Was there a difference in framing of climate change in the four newspapers examined?	X
Sub research question 7: Which actors were covered in the context of climate change in the four newspapers examined?	X

Public sphere

The public's attitude to climate change

Hypothesis	Differences	No differences
Hypothesis 6: German as well as Australian climate change coverage demands that national politicians tackle climate change.	X	
Hypothesis 7: German climate change coverage contains few frame sub-dimensions of the effects of climate change. In Australia, the media widely represents the effects of climate change.	X	
Sub research question 1: Does the response to an environmental disaster emphasise national activities, whereas the discourse in an election emphasises international activities?	X	
Sub research question 2: Does "Causal interpretation (effects of climate change)" appear more often during the environmental disaster than during the election?		X

Sphere of structural parameters

Political influence on the German and Australian climate change discussion energy supply, resources, and climate in Germany and Australia

Hypothesis	Differences	No differences
Hypothesis 1: Australia's climate change coverage is dominated by frames of causes and effects as well as of action. Germany's climate change coverage remains unspecific, just defining the problem.	X	
Hypothesis 2: Politicians in Australia have a greater stake in the representation of the national climate change discussion than those in Germany. They are more often mentioned in the country's newspapers than German politicians in German newspapers.	X	
Hypothesis 8: Whereas the newspaper coverage around the election demands action, the media informs the public about the consequences of climate change during the time of the environmental disaster.		X
Sub research question 4: Are political actors predominant during the time of the political election, whereas other actors are predominant during the time of the environmental disaster?		X

Summarising these results, the *Public sphere*, so the public's attitude towards climate change, showed the most differences in terms of climate change coverage: it included differences regarding the politicians who should tackle climate change, the effects of climate change, and about climate action referring to an environmental disaster and a political election. The *Societal Sphere* and the *Sphere of structural parameters* included two hypotheses/sub research questions with differences and two without: there is a significant difference in framing climate change in the four newspapers as well as in *Frankfurter Allgemeine Zeitung* which referred to international actors (*Societal Sphere*). Moreover, Australia framed climate change in terms of causes, effects as well as of action; Germany's climate change coverage remains unspecific. Politicians were the dominant actors (*Sphere of structural parameters*). No differences were found in terms of sceptical viewpoints (*Societal Sphere*) or in the framing and the actors involved in climate change when comparing the two events (*Sphere of structural parameters*).

There were just one major difference relating to the *Institutional sphere*, with a broader variety of perspectives and actors in Australia than in Germany; this finding might be associated with the journalistic practice of so-called "balanced" reporting (see Chapter 3.3). The hypotheses and sub research questions representing the *Subject sphere* and the *Professional sphere* reveal no differences.

8.5. Appreciation of the results

The results of this research show that the climate change debate in the media is still diverse: altogether 53 *frame sub-dimensions*, which are associated with the four – extended to five – frame elements identified by Entman (1993) were used. This variety of frame sub-dimensions made it possible to test a broad range of hypotheses and sub research questions in order to identify differences and similarities in the two countries examined. In addition, the number of frame sub-dimensions made it possible to identify seven frames using a cluster analysis which also represent the diversity of ways in which climate change is framed in the media, ranging from general statements about the existence or absence of climate change to ecological and economical aspects. In percentage, the most commonly used frames for Germany are "Disconnected problem definition" as well as "Treatment recommendation: international", for Australia "Disconnected problem definition" as well as "Treatment recommendation: national". The possibility to test such a variety of frame sub-dimensions and frames might be associated with a research period which was not connected with a specific climate change event; situations in which climate change was not necessarily a key focus for the media were examined.

Besides the framing, there is also considerable variety in the *actors* represented in the newspapers examined: they are summarised in six groups of actors in which journalists as well as politicians play the most important role.

The dominance of political actors, a key finding of this research, shows that the issue of climate change can be shaped by the media especially by choosing the right multipliers. This might be also the case in a country such as Germany, which should be able to resist such influences due to its established value system in terms of climate change (Weidner 2008, p. 24 f). Therefore, journalists have a great responsibility to keep a sharp focus on the climate change mindset of the ruling elites of their country and to consider how these elites are using their influence.

This is a challenge, as the journalists – the biggest group of actors reviewed in this research – are not as independent as they should be. There are factors from inside the media conglomerates which influence perspectives on climate change. Fairfax Media Limited, the Australian media conglomerate examined in this research, for example, demands diversity in terms of climate change coverage and actors representing it. However, the challenges of climate change, its causes and effects, as well as the action needed to tackle climate change become blurred with this demand. So, climate change coverage is open to interpretation and, consequently, allows readers to avoid taking responsibility.

Moreover, the *informing writing style*, which is based on facts and data, dominates the climate change coverage of German and Australian journalist. However, it does not fully protect climate change coverage from facts and data presented by climate-change-sceptical scientists.

The role of national as well as international actors in the climate change discussion is also analysed in this research. A connection was found between national activities in the context of the environmental disaster and international activities in the context of the election. Moreover, German climate change coverage asked international politicians to tackle climate change, whereas Australian climate change coverage wanted national politicians to do so.

Summarising all results, the *comparative analysis of the two countries* includes the most significant differences. Hypotheses as well as Sub research questions in terms of frames/frame sub-dimensions and actors show some significant differences. An exclusion is the frame “Sceptical views”, which appears equally in the two countries, and – as already said – the form of expression with an informing writing style being most dominant. Comparing the two events as well as the time period before and after the election/the environmental disaster, mainly similarities are identified.

The *Public sphere*, the *Societal Sphere* and the *Sphere of structural parameters* include the most significant differences: they show differences in the representation of the public's attitude in terms of climate change, in the framing of climate change in the four newspapers, and that frames of causes, effects and action as well as political actors dominate the Australian climate change coverage.

Besides, the results of this research also show that environmental disasters are not represented as an effect of climate change in the newspapers of the two countries that were analysed. This was surprising due to the large extent of the damage the two floods caused. So, there must be one or more frames/frame sub-dimensions relating to environmental disasters which are given more importance in journalistic practice after such an event; news values might play a central role in framing such environmental disasters.

The similarities in the climate change coverage in Germany and Australia, especially when comparing the two events as well as the research period before and after the election and the environmental disaster, at first, imply that issues are represented in a similar way in the media of the two countries. However, the analysis of the four examined newspapers show highly significant differences when looking at the identified frames.

8.6. Limitations

The results of chapter 8.3 to 8.5 make clear: the differences in climate change coverage in Germany and Australia are rather low, especially when comparing the events and time periods. And the question is, what might be the reasons for these results?

One reason could be that climate change referring to an event representing social and economical consequences (environmental disaster) as well as to an event representing political and medial consequences (election campaign) offers a lot of space for an agenda besides climate change. Journalists covering an environmental disaster might prefer to refer to a news value such as "Human interest", "Conflict" or "Disaster" and a political election campaign might refer to current national aspects. Thus, the two events are not necessarily focussed on climate change as it is the case when analysing a COP.

This work was built on 52 sub frame-dimensions, which were combined into 12 indices. Based on these dimensions seven frames were identified by a hierarchical cluster analysis. These indicators have been used for testing the hypotheses and answering the sub research questions. However, this approach might be too undifferentiated to provide a complete picture of the climate change coverage in the two countries. Indeed, the frames could have had

a higher priority in this research. A possible approach might be to examine the frames on a monthly basis over the time of the research period, to discover how the coverage developed.

Looking at the limitations of the methodology/study design, as stated in Chapter 3.5, the newspapers were chosen because they had the highest circulation in each country and thus influence public opinion on a broad scale. For Australia, this decision, however, had the consequence that the two newspapers examined – *The Sydney Morning Herald* as well as *The Age* – are from the same media owner, i. e. Fairfax Media Limited. Although sub research question 6 shows major differences in terms of framing, it can be assumed that these two newspapers have the same political orientation. For future research, it would be better to examine two newspapers with different media owners.

Besides this aspect, there are factors that may have influenced the results of this research – mainly the climate conferences that take place in November each year. Moreover, for the 2009 German election, the financial crisis might still have dominated the political agenda.

In addition, the fact that only one coder was used for this examination is a limitation, although the weighted average coefficient was 0.87, which is a good result. The coefficient for the actors was 0.87 as well, for the form of expression the coefficient was 0.89. Using only one coder could result in a one-sided view on the topic being analysed, because the coder might develop his or her own interpretation during the coding process.

Looking at the discussion of the research results, it would have been of interest to make a connection between the framing of the articles and the climate change actors. This research could not identify which actor stands for which frame sub-dimension. This raises a number of questions for further research.

In addition, this research cannot identify whether there are actors who take responsibility for tackling climate change. Findings concerning this aspect are, however, of major interest, because powerful political or scientific leaders who feel responsible for this issue are needed to get the international community to take action on climate change. It might be a useful indication that the responsibility frame does not appear sufficiently often.

Last, it cannot be identified how much influence lobbyists or conservative think tanks have on the framing of scientific work or political statements. Therefore, the public relations activities, for example those of the oil industry, with their framing of climate change need to be analysed and compared with the climate change frame sub-dimensions of the political or scientific actors referred to in the newspapers.

8.7. Recommendations for further research

As mentioned in the discussion and in the limitations section, there are some issues which cannot be answered through this research. The following aspects of climate change, climate change actors, and writing style need to be examined in further research.

First, the framing of climate change.

One finding of this research was that there was no significant difference related to sceptical voices when analysing the climate change coverage in Germany and Australia. As a reason for this finding, it was assumed – contrary to much other climate change research – that this research would not explicitly analyse the coverage around a climate change conference. So, it is of further interest to compare the agenda of print, but also of other media in different countries, in terms of climate-change-sceptical positions beyond climate change policy related events.

In addition, the framing after an environmental disaster might be of interest for further research. The results of this research suggest that there are frames/frame sub-dimensions – other than those referring to climate change – accompanying the coverage of an environmental disaster. Thus, it might be of interest to know the role climate change plays in the media discussion of an environmental disaster. And it would be valuable to get an impression of which frames/frame sub-dimensions are dominant in this kind of media discussion.

Whether Western climate change coverage differs in terms of frames/frame sub-dimensions appearing in print and in other media is another aspect for further research. For this a number of different print and other media in Western countries should be studied.

Second, this section examines the actors involved in climate change.

An interesting aspect might be to investigate whether there is an increase of influence in terms of economic interests and conservative think tanks getting a voice in climate change coverage. This question is of special interest for Germany because this research identified a generalisation of climate change through the predominance of the frame “Disconnected problem definition”. The difficulty concerning this question is, however, the opaqueness of lobbyism in Germany and Australia. So, it must be considered that politicians might represent economic interests as the result of lobbyism.

Another finding in this research revealed the influence of Australian politicians/the Australian government when it comes to climate change coverage. Whether this influence is as great as was identified in this research or whether – due to balanced reporting – enough other

voices are heard could not be clarified. Therefore, it would be of interest to identify the long-term influence of the Australian government on the country's media landscape in terms of climate change coverage by analysing more than one political election or even the period from one election to another.

Third, the writing style offers opportunities for further research.

Here, the self-awareness of Australian journalists being “watchdogs” – monitoring the government or business elites – leads to the question whether there is a highly captious news coverage due to a greater aspiration to play this role. A larger data set of articles that only has journalists as climate change actors might provide an answer to this question.

Besides these recommendations for further research, this analysis identified further questions which are situated outside the field of content analysis. These questions are briefly introduced below.

Alongside politicians, journalists are a clearly important group in climate change coverage. This research discovered that the socialisation of climate change journalists in Germany and Australia is quite similar, although the self-concepts are different – “informer and criticiser” (German journalists) versus “watchdog and analyst” (Australian journalists). The impression that there seems to be the same demand for climate change coverage, has, however, to be verified by further analysis. In addition, a further look at the socialisation and self-concept of editors-in-chief and media owners who finally edit and approve the media coverage might be of interest for further research.

Moreover, it would be interesting to find out which climate change actors are considered by the public to be most reliable. This is of special interest because of the sceptical voices on climate change, which have been identified to an equal extent in both countries.

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10. Appendices

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In 2010, Germany and Australia had to deal with extreme floods. Was climate change considered as cause of these weather events in the media? In 2009, a conservative alliance committed to tackle climate change won the German election. In 2007, the Australian Labor Party claimed that "climate change is the greatest moral challenge of our time" and won the election. But how was climate change covered by the media in the context of these two elections?

This work answers these two questions comparing the climate change coverage of two German and two Australian quality newspapers ($n = 1.012$ articles). As theoretical foundation Entman's (1993) framing approach and the "Extended Sphere Model", which provides a framework for the explanation of the differences in the coverage, were applied. With a hierarchical cluster analysis seven frames were identified. Moreover, six actor groups were differentiated and possible influencing factors were compiled.

The results show that the differences in terms of climate change coverage in quality newspapers are rather low between the two countries. Some of the observed differences could be explained by the proposed model. But the most striking results are certainly the similarities in the coverage. Common media standards in terms of climate change coverage could, however, not be identified in this work.

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